Dynamics
Spring 2021

Instructor:	Dr. **Amir K. Miri**
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Office Hours:	Friday 14:00 pm-15:15 pm
	https://rowan.zoom.us/j/3389528735?pwd=dW93WUs0RFA1bnU3THBPTlhLcStvdz09

Time/Locations: Friday 10:00 am-12:30 pm (Sync. Remote Lectures)
https://rowan.zoom.us/j/3389528735?pwd=dW93WUs0RFA1bnU3THBPTlhLcStvdz09
In Case of Physical Presence: **Engineering Hall 321**

Tutoring by Mr. Mark Schwalm: Tuesday 13:15 pm-14:45 pm (Sync. Remote Tutorials)
https://rowan.zoom.us/j/2769684424?pwd=N3hlb2tKaEs5Um4ydFFpOHJOTmxuQT09

Textbook: ***Engineering Mechanics: Dynamics,*** Ninth Edition (or Eighth Edition)
(Required)   James L. Meriam, L. G. Kraige, J. N. Bolton, Wiley, 2018.
ISBN: 978-1-119-39098-5

Prerequisite: Physics I; Calculus II.

Course Description:
This course is designed to provide the student with a clear and thorough demonstration of the theory and applications of engineering mechanics (Dynamics). Dynamics is the branch of mechanics which deals with the motion of bodies under the action of forces. The material covered in this course is crucial to subsequent courses in the mechanical engineering curricula.

Course Objectives:
Students will demonstrate a knowledge of the following:
1. Displacement, velocity, and acceleration in both scalar and vector terms for rectilinear and curvilinear motion.
2. Kinematic and kinetic analyses for particles.
3. Momentum and energy methods for particles.
4. Kinematic and kinetic analyses for rigid bodies.
5. Momentum and energy methods for rigid bodies.
6. Newton's Equations of Motion.
7. Angular momentum and conservation of angular momentum, work and energy, conservation of energy, impulse and momentum, and conservation of momentum.
8. Correlation of the principles of work, energy and conservation of energy for particles and rigid bodies.

Software:
MATLAB

Relationship of Course to Student Outcomes:
This course requires the student to demonstrate the following:
1) Identify differences between static and dynamic systems
2) Determine the acceleration of single particles and multiple particles
3) Determine the role of impact in particle motion

Grading:

Homework	20%
Exam/Quiz I	15%

Exam/Quiz II	15%
Exam/Quiz III	15%
Final Exam	23%
Class Activity	12%
Total	100%

A	92-100%	A-	90-92%	B+	88-90%	B	82-88%
B-	80-82%	C+	78-80%	C	72-78%	C-	70-72%
D+	68-70%	D	62-68%	D-	60-62%	F	0-60%

Academic Integrity Policy / Classroom Behavior Policy:

>   For Academic Integrity Policy and Classroom Behavior Policy, please refer to the Student Information Guide and Student Handbook.

Disability Accommodation:

>   Your academic success is important. If you have a documented disability that may have an impact upon your work in this class, please contact me. Students must provide documentation of their disability to the Academic Success Center in order to receive official University services and accommodations. The Academic Success Center can be reached at 856-256-4234. The Center is located on the 3rd floor of Savitz Hall. The staff is available to answer questions regarding accommodations or assist you in your pursuit of accommodations. We look forward to working with you to meet your learning goals.

Course Schedule:

Week	Topics	Reading	Exams
1 (01/25)	Introduction	Ch. 1	
2 (02/01)	Kinematics of Particles – Rectilinear/Curvilinear Motion	Ch. 2	
3 (02/08)	Kinematics of Particles – Polar/Curvilinear Coordinates	Ch. 2	
4 (02/15)	Kinematics of Particles – Relative Motion	Ch. 2	
5 (02/22)	Kinetics of Particles – Force, Mass, Acceleration	Ch. 3	Exam/Quiz 1
6 (03/01)	Kinetics of Particles – Work, Energy	Ch. 3	
7 (03/08)	Kinetics of Particles – Impulse, Momentum	Ch. 3	
8 (03/15)	Kinetics of Particles – Impact, others	Ch. 3	Exam/Quiz 2
9 (03/22)	Kinetics of Systems of Particles – Newton's Low, Work & Energy Relation, others	Ch. 4	
10 (03/29)	Kinetics of Systems of Particles – Impulse & Momentum Relation, Energy Conservation	Ch. 4	
11 (04/05)	Plane Kinematics of Rigid Bodies – Rotation, Motion	Ch. 5	Exam/Quiz 3
12 (04/12)	Plane Kinematics of Rigid Bodies – Relative Velocity	Ch. 5	
13 (04/19)	Plane Kinematics of Rigid Bodies – Relative Accelerat.	Ch. 5	
14 (04/26)	Plane Kinetics of Rigid Bodies – Equations of Motion!	Ch. 6	

This schedule is preliminary and subject to change!

Policies

It is required to create an account in WileyPlus for this course. The Course ID is e98288b5-c8c6-4f09-8e29-e4d8ff10e3d1. This way you will have access to the textbook (Online), practice examples, and homework problems. Please watch this video if you never used WileyPlus: https://bcove.video/2EEjvvY

Attendance is mandatory for all sessions (Wednesdays). The attendance will be recorded via a Google questionnaire collected at the end of each session (this is a part of a funded NSF project). A link will be sent via email and you will have five minutes to answer four multi-option questions and one descriptive question.

Pre-Lecture PowerPoints or Texts (PDF) will be uploaded into Canvas during the weekend time. Covering the uploaded documents and practicing pre-class problems (if suggested by instructor) will be Mandatory for this course. The instructor will ask students (based on a random selection) on pre-reading materials.

All assignments are due on the specified due date (Canvas). No late returns will be accepted. Three exams/quizzes will be given throughout the semester (the schedule is tentative). No make-up exams or assignments will be given unless a medical or other verified emergency is the reason for missing the exam or the assignment.

In order to effectively accomplish the goals and objectives for this course, students are expected to attend online/physical sessions and be on time. If you are absent for any reason, it is your responsibility to find out what you missed by contacting your classmates. Excessive absence or tardiness results in a lower final grade for the course.

Updates for Fall 2020 course delivery plans.

For Academic Integrity Policy and Classroom Behavior Policy, please refer to the Student Information Guide and the following links:

Attendance Policy and Interim Amendment for Fall 2020 (Links to an external site.)

Accommodation Policy and Office of Disability ResourcesLinks to an external site.

Academic Integrity Policy.

Classroom Behavior Policy. and Interim Amendment for Fall 2020 (Links to an external site.)

All Academic Policies.

Rowan University resources for students:

Return to Rowan.

Division of DEI and Rowan University Diversity Statement.

Student Sexual Misconduct/Title IX Reporting Form.

Student Discrimination, Harassment, and Retaliation.

Dean of Students Office/Seeking Assistance.

Rowan Thrive.

ProfCents Affordability Resources.

Student Success Programs. and Writing Center.

Wellness Center/Counseling & Psychological Services.

Rowan Success Network.