

## EGM 3401 - Dynamics Spring 2021

### COURSE INSTRUCTOR

**Instructor:** Dr. Anil V. Rao, MAE-A 314, E-mail: [anilvrao@ufl.edu](mailto:anilvrao@ufl.edu). Tel: 352-392-5523 (Office); (352) 672-1529 (Mobile, for Calls and Texts). All contact methods are acceptable!

### COURSE OBJECTIVE

The objective of this course is to provide a thorough and systematic introduction to the subject of dynamics of particles and rigid bodies using a Newton-Euler approach. The course provides a rigorous introduction to kinematics of particles and rigid bodies, kinetics of a particle, kinetics of a system of particles, and kinetics of a rigid body. All development is done in a coordinate-free manner and will be applied to examples in a way that provides insight into the structure of the underlying physical process.

### IMPORTANT NOTE

I consider it an honor and a privilege to be able to teach all of you, and I intend to provide the best instruction possible in order to enable you to learn the material well. If you cannot make office hours, please contact me and we will set up a time for you to get help. Regardless of how busy I am with other things, I will do what I am able to make myself available.

### COURSE TOPICS

Kinematics or particles and rigid bodies, kinetics or particles, kinetics of a system of particles, kinetics of a rigid body, and principles of work, energy, and momentum.

### APPROXIMATE SCHEDULE FOR COVERAGE OF TOPICS

Topic	Schedule for Coverage
Kinematics	Weeks 1 Through 4
Kinetics of Particles	Weeks 5 Through 7
Kinetics of a System of Particles	Weeks 8 Through 9
Kinetics of Rigid Bodies	Weeks 10 Through 14

**Note:** if for some reason you are unable to make my office hours, you can always schedule an appointment at a time that is mutually agreeable to both you and I.

### COURSE LOCATIONS AND CLASS PERIODS

MWF Period 3 (9:35 AM to 10:25 AM) via Zoom. Click [here](#) for Zoom link to lecture.

### OFFICE HOURS

Name	Office Hours	Contact Information
Anil Rao (Instructor)	M-Th: 12:00 PM to 1:30 PM via <a href="#">Zoom</a>	E-mail: <a href="mailto:anilvrao@unl.edu">anilvrao@unl.edu</a> Mobile: (352) 672-XXXX
Gabriela Abadia (Teaching Assistant)	M: Period 6 W: Periods 6/7 via <a href="#">Zoom</a>	<a href="mailto:gabadia97@unl.edu">gabadia97@unl.edu</a>
Cale Byczkowski	Tu: 2 PM to 5 PM	

(Teaching Assistant)	via <a href="#">Zoom</a>	<a href="mailto:cale.byczkowski@ufl.edu">cale.byczkowski@ufl.edu</a>
Mackenzie Peck (Teaching Assistant)	Tu/Th: Period 4 via <a href="#">Zoom</a>	<a href="mailto:mpeck1@ufl.edu">mpeck1@ufl.edu</a>
Kaeli Smith (Teaching Assistant)	Tu: Periods 5/6. Th: Period 5 via <a href="#">Zoom</a>	<a href="mailto:ksselephant@ufl.edu">ksselephant@ufl.edu</a>
Shan He (Teaching Assistant)	Th: 2 PM to 5 PM via <a href="#">Zoom</a>	<a href="mailto:shanhe0824@ufl.edu">shanhe0824@ufl.edu</a>

\*Please do not hesitate to contact me by e-mail, mobile phone, or text message if you need help!

### TEXTBOOK

Rao, A. V., *Dynamics of Particles and Rigid Bodies: A Systematic Approach*, Cambridge University Press, 2006.

### LECTURE VIDEOS

Lecture videos for the course can be found by clicking [here](#)

### HOMEWORK ASSIGNMENTS

The homework assignments are shown below and consist of three (3) theory assignments and seven (7) problem sets. The three theory homework assignments will each be worth seven (7) percent for a maximum of 21 percent of the final score. The seven problem sets will be each be worth two (2) percent for a maximum of 14 percent of the final score. For each of the problem solving assignments your grade will be based on the grading of one problem that will be chosen at random. Although the entirety of each problem-solving assignment will not be graded, you are expected to do all of the problems on these assignments them because your performance on the exams will depend upon your ability to solve problems. **All assignments are due at 5:00 PM on the due date and must be submitted electronically through the Canvas (E-Learning) system.**

Assignment Number	Assignment Contents	Due Date
Problem Set #1	Chapter 2: 1-5, 8, 10	29 January 2021
Problem Set #2	Chapter 2: 13, 15, 17, 19-21, 23	12 February 2021
Theory Assignment #1	<a href="#">Click Here for Assignment</a>	5 February 2021
Problem Set #3	Chapter 3: 1-3, 5, 7, 9, 10, 11	19 February 2021
Problem Set #4	Chapter 3: 12, 13, 17, 19, 20, 22	5 March 2021
Theory Assignment #2	<a href="#">Click Here for Assignment</a>	26 February 2021
Problem Set #5	Chapter 4: 1, 10, 12, 15, 17	19 March 2021
Problem Set #6	Chapter 5: 2, 3, 5, 6, 7	2 April 2021
Problem Set #7	Chapter 5: 8, 10, 11, 12, 17	16 April 2021
Theory Assignment #3	<a href="#">Click Here for Assignment</a>	9 April 2021

### EXAM SCHEDULE, FORMAT, AND EXPECTATIONS

#### EXAM FORMAT

All exams will be held in the evenings from 8:00 PM to 11:00 PM on the dates indicated below. The exams will be distributed and submitted via Canvas. It is important to note that in this course you will be examined on a balance of both theory and problem solving. Specifically, each exam will consist of 40 percent theory and 60 percent problem-solving. Because of the manner in which the exams are structured, it is *extremely important* that you understand the theory in addition to just being able to solve problems. Furthermore, because the homework questions take a great deal of time and thought, I urge each of you to do the assignments on the schedule I provide and not wait until the last minute to complete the assignments. If you procrastinate on completing the homework assignments, it will be reflected in your exam and quiz scores. Late exams will not be accepted regardless of the circumstances. Please scan and submit your exam with ample time for any issues with submission on Canvas.

#### MATERIALS PERMITTED FOR USE DURING EXAMS

The exams are open-book and open-notes. Other than a calculator, no other electronic aids of any kind may

be used except for downloading, scanning, and submitting the exam electronically. You are not permitted to discuss the exams with anyone else. Anyone who is suspected of cheating will be reported to the Dean of Students Office in accordance with the University of Florida regulations. My suggestion: be honest and do your own work.

EXAM	ROOM
EXAM 1: 25 February 2021 8:00 PM to 11:00 PM	Distributed Electronically Submitted Electronically
Exam 2: 25 March 2021 8:00 PM to 11:00 PM	Distributed Electronically Submitted Electronically
EXAM 3: 21 April 2021 8:00 PM to 11:00 PM	Distributed Electronically Submitted Electronically

### ATTENDANCE RULES

Regular attendance is expected of all students. All attendance rules will be follow the official [University of Florida Attendance Policies](#) as found by clicking [here](#). Attendance will be monitored via in-class quizzes that will not be announced in advance of the lecture (see grading below).

### MAKE-UP EXAM POLICIES

The following list comprises the only legitimate reasons to request an exam make-up or reschedule: (1) a student illness with a note from a physician that the student was ill on the date of the exam; (2) a family emergency that requires immediate attention; (3) a legitimate absence based on the University of Florida approved absences for University related participation in extra-curricular activities; (4) University of Florida exam policies based on a conflict with an exam in another course. In this last case, the exam conflict is resolved in accordance with the rule that the student may ask for the exam in this course to be rescheduled if the other course has a higher course number (that is, a course with number "3402" or higher), but must ask that the exam in the other course be rescheduled if the course number of the other course is less than "3401".

### COURSE GRADING

Item	Percent Value
Problem Sets	7 @ 2 Percent = 14 Percent
Theory Assignments	3 @ 7 Percent = 21 Percent
Exam 1	25 Percent (If Max Score). 20 Percent (If Not Max Score)
Exam 2	25 Percent (If Max Score). 20 Percent (If Not Max Score)
Exam 3	25 Percent (If Max Score). 20 Percent (If Not Max Score)
Total	25 Percent (If Max Score). 20 Percent (If Not Max Score)
	<b>100 Percent</b>

### GRADING SCALE

Grades in this course are determined using the following scale:

Letter Grade	Score Range
A	95 and Above
A-	90 to less than 95
B+	85 to less than 90
B	80 to less than 85
B-	75 to less than 80
C+	70 to less than 75
C	65 to less than 70
C-	60 to less than 65
D+	55 to less than 60
D	50 to less than 55

D-	45 to less than 50
E	Less Than 45

### NOTES ON ASSIGNMENT OF FINAL LETTER GRADES

- I reserve the right to raise everyone's score by the same amount based on class performance. In other words, if I choose to raise everyone's scores, all scores will be increased by the exact same amount. In no case will anyone's score be shifted downwards (reduced).
- Any score on the boundary between two ranges will receive the higher grade (for example, a 94 receives a grade of "A-").
- Finally, it is noted that while your individual scores for assignments, exams, and quizzes will be posted on E-learning (Canvas), the Canvas portal may not accurately reflect a student's relative standing in the class. Regardless of the information that is seen in Canvas, computation of final grades will be based on the criteria set forth above and a student's grade will only be final when grades have been computed at the end of the semester.

**IMPORTANT NOTE:** Any assignment either not submitted or not completed with a good faith effort (where the judgment of "good faith effort" rests wholly with me) will result in a full letter grade deduction in the course. For example, if the final score falls into the category of an "A-" and one homework or quiz is not submitted or is deemed to not have been performed with a good faith effort, the final grade will be a "B-". This policy is not flexible.

### IMPORTANT NOTE REGARDING RECORDING OF SESSIONS

This class contains sessions that may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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