EGM 3401 – Dynamics Spring 2025

COURSE INSTRUCTOR

Instructor: Dr. Anil V. Rao, MAE-A 314, E-mail: anilyrao@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, 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

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

COURSE TOPICS

APPROXIMATE SCHEDULE FOR COVERAGE OF TOPICS

Schedule for Coverage

Weeks 1 Through 4

Weeks 5 Through 7

Weeks 8 Through 9

Weeks 10 Through 14

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.

Topic Kinematics **Kinetics of Particles** Kinetics of a System of Particles Kinetics of Rigid Bodies

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 6 (12:50 PM to 1:40 PM). Turlington L011.

will do what I am able to make myself available.

OFFICE HOURS

Contact Information Name Office Hours Tue/Th: 2:00 PM to 4:00 PM E-mail: anilvrao@ufl.edu Anil Rao Mobile: (352) 672-1529 Reitz Union Food Court (Instructor) Mon/Wed: 2:00 PM to 3:30 PM George Haman III Reitz Union Food Court (Teaching Assistant) georgehaman@ufl.edu

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

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

Assignment

The homework assignments are shown below and consist of three (3) theory assignments and 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 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.

Due

Number Contents Date **3 January 2025** Problem Set #1 Chapter 2: 1-5, 8, 10 Chapter 2: 13, 15, 17, 19-21, 23 19 February 2025 Problem Set #2 Theory Assignment #1 14 February 2025 **Click Here for Assignment** Chapter 3: 1-3, 5, 7, 9, 10, 11 28 February 2025 Problem Set #3 Problem Set #4 Chapter 3: 12, 13, 17, 19, 20, 22 14 March 2025 Problem Set #5 Chapter 4: 1, 10, 12, 15, 17 28 March 2025 Click Here for Assignment 31 March 2025 11 April 2025 Problem Set #6 Chapter 5: 2, 3, 5, 6, 7 25 April 2025 Problem Set #7 Chapter 5: 8, 10, 11, 12, 17 25 April 2025 Theory Assignment #3 **Click Here for Assignment**

Assignment

EXAM SCHEDULE, FORMAT, AND EXPECTATIONS

EXAM FORMAT

All exams will be in take-home format from 8:00 AM to 11:59 PM on the dates indicated below. The exams 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 your 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 Distributed Electronically EXAM 1: 4March 2025 Submitted Elecronically 8:00 AM to 11:59 PM Exam 2: 22 March 2025 Distributed Electronically 8:00 AM to 11:59 PM Submitted Elecronically

ATTENDANCE RULES

Regular attendance is expected of all students. All attendance rules will be follow the official University of Florida 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

Percent Value ltem **Problem Sets** 7 @ 2 = 14 Points $3 \otimes 8 \text{ Points} = 24 \text{ Points}$ Theory Assignments 35 Points Exam 1 35 Points Exam 2 Total 108 Points

GRADING SCALE

Grades in this course are determined using the following scale:

discuss their access needs, as early as possible in the semester.

the faculty or lecturer during a class session.

Letter Grade

Score Range 90 and Above 85 to less than 90 Α-80 to less than 85 75 to less than 80 70 to less than 75 65 to less than 70 C+ 60 to less than 65 55 to less than 60 C-D+50 to less than 55 45 to less than 50 40 to less than 45 Less Than 40

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 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.

STUDENTS REQUIRING ACCOMMODATIONS Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, in their Canvas course menu under GatorEvals, in their Canvas course menu under GatorEvals.aa.ufl.edu/public-

results/.

COURSE EVALUATIONS

criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor hired or appointed by the University, or by a guest instructor, as part of a University of

Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations, exams), field trips, private conversations between students in the class or between a student and

IN-CLASS RECORDING Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes for which these recordings may be used are strictly controlled. The only allowable purposes for which these recordings may be used are strictly controlled. The only allowable purposes for which these recordings may be used are strictly controlled. The only allowable purposes for which these recordings may be used are strictly controlled.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

UNIVERSITY HONESTY POLICY

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the

following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions.

Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

COMMITMENT TO A SAFE AND INCLUSIVE LEARNING ENVIRONMENT

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender,

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following: • Your academic advisor or Graduate Program Coordinator • Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu

• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu • Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

STUDENT PRIVACY

HEALTH AND WELLNESS

U Matter, We Care: Your well-being is important to the University of Florida. The U Matter, We Care initiative is community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies. Sexual Discrimination, Harassment, Assault, or Violence: If you or a friend has been subjected to sexual discrimination, sexual discrimin

Sexual Assault Recovery Services (SARS): Student Health Care Center, 392–1161.

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University Police Department: 392–1111 (or 9–1–1 for emergencies), or http://www.police.ufl.edu/.