

## Elements of Dynamics

EGM 3400 Section 7D39, 72A1

**Class Periods:** TR, 2<sup>nd</sup> period, 9:30 am – 10:35 am

**Location:** NEB 201

**Academic Term:** Summer 2018

### **Instructor:**

Philip B. Jackson, Ph.D.

[philipbjackson@ufl.edu](mailto:philipbjackson@ufl.edu)

(352) 392 - 4521

Office Hours: MWF, 2:00 pm – 4:00 pm, NSC 202E

### **Teaching Assistants:**

Please contact through the Canvas website

- Jessica Waissmann, [jesswais08@ufl.edu](mailto:jesswais08@ufl.edu), see Canvas for office hours

### **Course Description**

Dynamics of particles and rigid bodies for rectilinear translation, curvilinear motion, rotation and plane motion. Also includes principles of work and energy, and impulse and momentum.

### **Course Pre-Requisites / Co-Requisites**

EGM 2511 and MAC 2313

### **Course Objectives**

This course provides an undergraduate coverage of basic dynamic systems. The course emphasizes the fundamental principles of vector analysis to both particles and rigid bodies, the application of Newton's laws of motion and conservation of energy, the concept of impulse and momentum, and the general calculation of dynamic states in three dimensions. Students will learn to apply these concepts through exposure to numerous practical engineering problems. Upon completion of the course, students are expected to have developed a thorough understanding of the fundamentals of dynamics and problem-solving techniques applicable to dynamical systems.

### **Materials and Supply Fees**

None

### **Professional Component (ABET):**

None

### **Relation to Program Outcomes (ABET):**

Outcome	Coverage*
a. Apply knowledge	Medium
b1. Conduct experiments	
b2. Statistical design of experiments	
c. Design	
d. Function on teams	
e. Solve problems	High
f. Professional and ethical responsibility	Low
g. Communicate	
h1. Economic impact	
h2. Global, societal, and environmental impact	Low
i. Lifelong learning	Low
j. Contemporary issues	Low
k. Techniques, skills, and tools for degree program	High

\*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

### **Required Textbooks and Software**

- Engineering Mechanics: Dynamics
- Hibbeler, R.C.
- 2013, 14<sup>th</sup> Edition
- 9780133915389

(course notes developed by the instructor)

### **Recommended Materials**

- None

### **Course Schedule**

Week 1:	Introduction, Kinematics of a Particle, Rectilinear Motion
Week 2:	Kinematics of a Particle, Curvilinear Motion
Week 3:	Kinetics of a Particle, Forces, Rectangular Coordinates
Week 4:	Energy, Work, Systems of Particles
Week 5:	Conservation of Energy, Power, Potential Energy
Week 6:	Linear Impulse and Momentum
Week 7:	Angular Impulse and Momentum
Week 8:	Planar Kinematics of a Rigid Body, Translation, Rotation
Week 9:	Planar Kinetics of a Rigid Body, Moments of Inertia, Forces
Week 10:	Planar Kinetics: Work and Energy
Week 11:	Planar Kinetics: Conservation of Energy
Week 12:	Planar Kinetics: Linear and Angular Momentum of Rigid Bodies

### **Attendance Policy, Class Expectations, and Make-Up Policy**

Class attendance is optional. Those who have no scheduling conflicts with the recording of live lectures are encouraged to attend but doing so is not mandatory. All homework will be submitted electronically and all quizzes will be administered through Canvas.

### **Evaluation of Grades**

Assignment	Total Points	Percentage of Final Grade
Homework Sets (6-8)	100 each	25%
Quizzes (4-6)	100 each	25%
Midterm Exam	100	25%
Final Exam	100	25%
		100%

### **Grading Policy**

Percent	Grade	Grade Points
90.0 - 100	A	4.00
89.0 - 89.9	A-	3.67
87.0 - 88.9	B+	3.33
80.0 - 86.9	B	3.00
79.0 - 79.9	B-	2.67
77.0 - 78.9	C+	2.33
70.0 - 76.9	C	2.00
69.0 - 69.9	C-	1.67
67.0 - 68.9	D+	1.33
60.0 - 66.9	D	1.00

59.0 - 59.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Students Requiring Accommodations***

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

### ***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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

### ***Software Use***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

## **Campus Resources:**

### Health and Wellness

#### **U Matter, We Care:**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our 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](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. 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:** <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

#### **Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

### Academic Resources

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu).

<https://lss.at.ufl.edu/help.shtml>.

**Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

<https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers.

<https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus:** [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.