Wright State University Spring 2019
Department of Mechanical and Materials Engineering

ME 2210: DYNAMICS

Instructor: Professor Nikolai V. Priezjev, Ph.D., (937) 775-3214, Rm. 430 Russ Engineering Center
Email: nikolai.priezjev@wright.edu Webpage: http://www.wright.edu/~nikolai.priezjev
Class Hours: MWF, 3:35 pm - 4:30 pm, Russ Engineer Cntr 153
Office Hours: MWF 4:30 - 5:20 pm or by appointment, Rm. 430 Russ Engineering Center
Grading: Logan Martin, email: martin.549@wright.edu
Textbook: *Vector Mechanics for Engineers: Dynamics*, Beer, Johnston, Mazurek and Cornwell, McGraw-Hill, 11th edition, 2016. **No late homeworks.**
Course Grade: 10% Problem Sets, 20% Exam I, 30% Exam II, 40% Final Exam
A: 100 to 90; B: 89 to 80; C: 79 to 70; D: 69 to 60; F: ≤ 59

Course Schedule: **Late homework receives no credit.**

	Date	Subject	Chapter(s) Covered	Homework Handout/Assignment	Due Date
1	1/14	rectilinear motion	11	#1: 11.8, 11.11, 11.21, 11.94, 11.103, 11.114	
2	1/16	rectilinear motion, curvilinear motion	11		
3	1/18	curvilinear motion, projectile motion	11		
4	1/21	**MLK Holiday, no class**	11		
5	1/23	curvilinear motion, projectile motion	11		
6	1/25	normal/tangential coordinates	11	#2: 11.49, 11.52, 11.74, 11.139, 11.142, 11.162	Hmwk #1
7	1/28	cylindrical coordinates	11		
8	1/30	dependent and relative motion	11		
9	2/1	**Review Session**	11		Hmwk #2
10	2/4	**Exam I**	11		
11	2/8	Newton's law, basic issues, rectangular	12	#3: 12.13, 12.18, 12.23, 12.28, 12.35, 12.41, 12.47.	
12	2/11	Newton's law, rectangular coordinates	12		
13	2/13	Newton's law, normal/tangential	12		
14	2/15	Newton's law, cylindrical	12		
15	2/18	Newton's law, more examples	12		
16	2/20	work and energy	13	#4: 13.9, 13.13, 13.17, 13.22, 13.29, 13.44, 13.56	Hmwk #3
17	2/22	work and energy	13		
18	2/25	potential energy and conservative systems	13		
19	2/27	potential energy and conservative systems	13		
20	3/1	impluse and linear momentum	13	#5: 13.123, 126, 137, 144, 149, 153, 156, 164	Hmwk #4
21	3/11	conservation of linear momentum	13		
22	3/4	Spring break			
23	3/6	Spring break			
25	3/8	Spring break			
26	3/13	impact	13		
27	3/15	impact	13		
28	3/18	angular momentum	14		
29	3/20	**Review Session**	12-14		Hmwk #5
30	3/22	**Exam II**	12-14		
31	3/25	rigid-body motion	15	#6: 15.8, 10, 23, 39, 44, 58, 63, 78, 105, 109, 114	

32	3/27	rigid-body motion, relative velocity	15		
33	3/29	relative velocity	15		
34	4/1	instantaneous center	15		
36	4/3	absolute and relative acceleration	15		
37	4/5	plane equations of motion	16	#7: 16.7, 9, 32, 76, 100, 131, 157	Hmwk #6
38	4/8	equations of motion with axis rotation	16		
39	4/10	two-d motion analysis	16		
40	4/12	two-d motion analysis	16		
41	4/15	energy methods	17	#8: 17.14, 17, 28, 60, 73	Hmwk #7
42	4/17	energy methods	17		
43	4/19	momentum methods	17		
44	4/22	momentum methods	17		
45	4/24	**Review Session**	11-17		Hmwk #8
46	4/26				
47	5/1	**Final Exam**	11-17		

All Exams are closed-book, closed notes, in-class exams. One-page (A4 format, both sides) formula sheet of your own creation is allowed. Make-up exams will be given only in the case of documented emergencies.

Comprehensive Final Exam: WEDNESDAY, MAY 1, 2019 Time: 2:45pm - 4:45pm

https://www.wright.edu/registrar/scheduling/exam-schedules#tab=2019-spring

Additional Course Resources:

Solution of old tests, instructional PDF files containing lecture notes, and other educational materials are available in **Pilot** to provide 'supplemental information' and to improve your understanding of the content. This information *is intended to augment*, not replace the course information contained in the required textbook.

Prerequisites:

MTH 2310, PHY 2400, ME2120

Problem Solutions:

Problem solutions must be neat and orderly. **They must include each of the following, when applicable.** You must be capable of making the decision of the information to include in your solutions. **For example:** To use Newton's law, you must draw a free-body diagram. Free body diagrams don't make sense, when not applying either Newton's laws or variants of Newton's laws, i.e. sketches for determining properties of areas, etc.

1. **Given:** Briefly state what you know from the problem statements
2. **Known Equations or Processes:** List all laws and principles that you will apply in solving the problem.
3. **Free Body Diagram:** Sketch *and/or* free body diagram (FBD). You must have at least one except under the most unusual circumstances where neither applies.
4. **List known quantities**, list *all* known variables and unknown variables in the vectors.
5. **What are you asked to find?** List exactly what you are expected to determine.
6. **Solution**: Generation of the set of equations with substitutions made. Solution if simple, set of equations to be solved if not. Solution is always expected on homework and exams.

7. **Check:** When you generate a solution, *does the result make sense*? As engineers, you must have insight as to whether or not an answer seems reasonable *before* you solve the problem. Check if units in the answer make sense.

Cheating: *Don't*

Footnotes:

You may also be notified via email during the quarter of other course specific information. Email will only be sent to your class account.

Academic Integrity: Students are encouraged to work together on homework and laboratory assignments. However, **COPYING OF WORK IS NOT PERMITTED**. The graders have been instructed to identify homework that displays evidence of verbatim copying; all such solutions will receive zero credit regardless of the source of the solution, i.e. the person providing the solution will also receive a zero score. Cases of academic dishonesty, which include copying of homework or lab assignments, plagiarism of lab abstracts, or cheating on exams, will be dealt with according to the procedures set forth in the university's academic integrity policy at http://www.wright.edu/students/judicial/integrity.html. College of Engineering and Computer Science students found guilty of two violations of the university's academic integrity policy are subject to dismissal.