

MEEN 2120: Dynamics

Spring 2014

Course Syllabus

- Instructor: Dr. Phil Voglewede
Office: Engineering Hall, Room 409
Phone: 414-288-7278
Email: philip.voglewede@marquette.edu
- Class Schedule: MWF 3:00pm - 3:50pm, EN 136
Attendance is **NOT** mandatory, but strongly encouraged
- Office Hours: M 11:00am-12:00pm
T 3:00pm-5:00pm
W 11:00am-12:00pm
Th 3:00pm-5:00pm
F 11:00am-12:00pm
I also adhere to an open door policy.
- Req. Textbook: *Vector Mechanics for Engineers: Dynamics*, F. Beer, E. R. Johnston, P. Cornwell, 10th Edition, McGraw Hill Higher Education, 2012. ISBN: 978-0077402327
- Reference Texts: *Engineering Mechanics: Dynamics*, J. L. Meriam and L. G. Kraige, 7th Edition, Wiley, 2012. ISBN: 978-0470614815
Engineering Mechanics: Dynamics, G. Gray, F. Constanzo, M. Plesha, 2nd Edition, McGraw Hill Higher Education, 2012. ISBN: 978-0073380308
Engineering Mechanics: Dynamics, R. Hibbeler, 13th Edition, Prentice Hall, 2012. 978-0132911276
- Course Web Page: All assignments and solutions will be posted exclusively on D2L. Course announcements will be sent to the email address in D2L.
- Grade Weighting:
- | | | |
|-----------------------------|-----|-------------------------------|
| FBD Proficiency Exam | 0% | (required to pass the course) |
| Homework | 20% | |
| Exam 1 (February 19) | 18% | |
| Exam 2 (March 26) | 18% | |
| Exam 3 (April 25) | 18% | |
| Final Exam (May 9 – 1:00pm) | 26% | |
- Grade Policy: The final grading will be **no more severe** than:
- | | |
|--------|----|
| 90-100 | A |
| 85-89 | AB |
| 80-84 | B |
| 75-79 | BC |
| 70-74 | C |
| 65-69 | CD |
| 60-64 | D |
| 0-59 | F |
- If you fail to satisfy the FBD proficiency exam requirements, you will be required to meet with Dr. Kim regarding your enrollment in the course.
- Grader: Michael Boyarsky (michael.boyarsky@marquette.edu)

Objectives

At the end of this course, students will be familiar with:

- The basic concepts of dynamics
- The concept of free body diagrams as applied to dynamics
- The concept of work-energy
- The concept of impulse-momentum

Course Policies

- *Prerequisites:* Students are assumed to have an undergraduate statics course (MEEN2110).
- *Academic Honesty:* All students are obliged to follow the Marquette University Policies on Academic Honesty. Cheating in any form will be prosecuted to the full extent allowed. Discussing homework (including specific approach) is allowed and encouraged. However, blind copying is NOT acceptable. Handing your homework to someone so they can get the answer is unacceptable. The general rule is that the work that you hand in must be yours.
- *Homework:* Homework will be assigned on Wednesday and due the following Wednesday within 2 hours after the hour the class concludes. Thus, your homework will be due at precisely 6:00pm. You may turn in the handwritten homework during class, via email, or slide it under Dr. Voglewede's door. Please do not turn in homework to Dr. Voglewede's mailbox. Late homework will receive a zero unless prior arrangements have been made. Format for the handwritten homework must follow the given format (see handout for more information). Illegible or poorly organized homework will receive a zero.
- *Free Body Diagram Proficiency Exam:* All students enrolled in the course MUST take a free body diagram (FBD) proficiency exam. The exam will be administered outside of class time by specially appointed teaching assistants. If you fail to pass the exam, you will be required to attend a FBD review session and retake the FBD proficiency exam. If you fail the exam on the second try, you must repeat the FBD review session and retake the FBD proficiency exam a third time. If you fail the FBD proficiency exam the third time, you must meet with Dr. Kyuil Kim, chair of the Department of Mechanical Engineering, regarding your withdrawal from the course.
- *Concept Inventory Exam:* In order to discover the areas of difficulty in the course, students will be given an online concept inventory exam at the beginning and end of the course. Students completing BOTH exams will have the lowest homework score dropped.
- *Exams:* Exams will be in class. You will be allowed a one page, handwritten "cheat sheet" with whatever you want on it, per exam. Thus, for the first exam 1 sheet, second exam 2 sheets, etc. Cheat sheets will need to be shown to Dr. Voglewede after the conclusion of the exam to ensure that it is handwritten. Taking exams before or after scheduled time is strongly discouraged; make-up exams may be more difficult than the scheduled exams. The format and coverage of the exam will be discussed 1 week prior to the exam date.
- *Regrades:* If you believe that your work was not graded correctly for some reason, you may request a regrade. However, you cannot receive credit for something that was not originally written on the paper. To request a regrade you must adhere to the following procedure:
 - Use a pen to show on your work where it was not graded correctly.
 - Write a short note explaining why you believe your result is correct, deserves more credit than you have been given, or misinterpreted. You must be very clear.
 - Turn in your work to Dr. Voglewede within **2 weeks** of the return of the assignment.

NOTE: While you can discuss grading with the grader, all grade changes must go through Dr. Voglewede.

Tentative Schedule

	S	M	T	W	H	F	S
January	12	13 Introduction Syllabus	14	15 Rectilinear Motion Diff. Relations	16	17 Rectilinear Motion Diff. Relations	18
	19	20 MLK Day	21	22 Relative Motion Cables	23	24 Curvilinear Motion Rect. Coords	25
	26	27 Rect. Coords. N-T Coords.	28	29 N-T Coords. R-Theta Coords.	30	31 R-Theta Coords.	
February							1
	2	3 Equations of Motion	4	5 Equations of Motion	6	7 Equations of Motion	8
	9	10 Ang. Momentum of a Particle	11	12 Work Energy Principle	13	14 Potential Energy Cons. Of Energy	15
	16	17 Impulse Momentum	18	19 Exam 1	20	21 Central Impact	22
	23	24 Oblique Impact	25	26 Oblique Impact Sys - Lin. Mom.	27	28 Sys - Ang. Mom. Cons. of Mom.	
March							1
	2	3 Sys - Work Energy Sys - Imp. Mom.	4	5 Rigid Body Kinematics	6	7 Rigid Body Kinematics	8
	9	10 Spring Break	11	12 Spring Break	13	14 Spring Break	15
	16	17 Rigid Body Kinematics	18	19 General Planar Motion	20	21 Instant Centers	22
	23	24 Rigid Body Accelerations	25	26 Exam 2	27	28 Relative Motion Coriolis Accel.	29
	30	31 Relative Motion Coriolis Accel.					
April			1	2 Eqns of Motion Inertia	3	4 Inertia Kinetics Procedure	5
	6	7 Rigid Body EOM	8	9 Rigid Body EOM	10	11 Rigid Body - Work Energy	12
	13	14 Rigid Body - Work Energy	15	16 Rigid Body - Impulse Mom.	17	18 Easter Break	19
	20	21 Easter Break	22	23 Rigid Body - Impulse Mom.	24	25 Exam 3	26
	27	28 Practice, Practice, Practice	29	30 Fun with Dynamics			
May					1	2 Final Review	3
	4	5	6	7	8	9 Final Exam 1pm-3pm	10
	42 Class days						
		Class days					
		Breaks					
		Exams					