

# MAE 3318 Kinematics and Dynamics

## MW 4:00PM~5:20PM at WH 311

### INSTRUCTOR

Daejong Kim, Ph.D., Assistant Professor

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Instructor office hours: TTh 2-4pm and by appointment

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TA office hours: MW 2-4pm

Location: 223WH Tel: TBD

### COURSE DESCRIPTION

The motion and interaction of machine elements. Fundamental concepts of kinematics and dynamics applied to the determination of forces acting on the parts of machines.

### COURSE OBJECTIVES

Synthesize mechanisms for specified performance. Analyze given mechanisms for position, velocity, and acceleration. Learn principles of cam design. Analyze static and dynamic forces at the joints

### STUDENT'S LEARNING OUTCOMES

1. Basic concepts and principles of kinematics.
2. Ability to synthesize and analyze mechanism and kinematic linkages
3. Ability to identify, formulate and solve engineering dynamics problems

### TEXTBOOKS

Design of Machinery (4<sup>th</sup> Edition)-An Introduction to the Synthesis and Analysis of Mechanisms and Machines by Robert L. Norton

### CLASS SCHEDULE (Tentative, subject to change over semester)

Weeks	Topics	Assignments & Exams
Week 1 Aug 30~	Chapter 1: Introduction Ch 2: Kinematics Fundamentals (D.O.F.)	
Week 2 Sep 6~	Ch 2: Kinematics Fundamentals; cont.	HW 1 (Ch.2)
Week 3 Sep 13~	Ch.4 Position analysis	
Week 4 Sep 20~	Ch.5 Analytical linkage synthesis	HW 2 (Ch.4)
Week 5 Sep 27~	Ch.5 Analytical linkage synthesis; cont.	
Week 6 Oct 4~	Ch.5 Analytical linkage synthesis; cont.	HW 3 (Ch.5)

Week 7 Oct 11~	Ch. 6 Velocity analysis	
Week 8 Oct 18~	Ch. 7 Acceleration analysis	HW 4 (Ch.6)
Week 9 Oct 25~	Ch. 8 Cam design	HW 5 (Ch.7) Exam 1 (Weeks 1~7)
Week 10 Nov 1~	Ch. 8 Cam design; cont.	
Week 11 Nov 8~	Ch. 10 Dynamics fundamental	HW 6 (Ch.8)
Week 12 Nov 15~	Ch. 11 Force analysis	HW 7(Ch.10)
Week 13 Nov 22~	Ch. 11 Force analysis; cont.	Exam 2 (Weeks 8~11)
Week 14 Nov 29~	Ch. 12 Balancing	HW 8 (Ch.11)
Week 15 Dec 6~	Course review Dec 8: Last day of classes (Final exam review)	HW 9 (Ch.12)
Week 16 May 3~	Final exam: Comprehensive Dec 15 (Wednesday) 2:00pm~4:30pm	

## GRADING

- 15% - Homework
- 20% - First exam
- 30% - Second exam
- 35% - Final exam

Course grading will be based on the following scale:

A (100-90%), B (89-80%), C (79-70%), D (69-60%) and F (below 59%)

## COURSE REQUIREMENTS

**1. Attendance** - Students are expected to be on time, attend class sessions, complete reading assignments and be prepared to participate in class discussions. If a student misses a class, it is his/her responsibility to make up the missed class (i.e. get the course notes, assignments or announcement from other students).

**2. Homework assignments** - Students should submit their homework assignments by 4:00pm on due dates in the classroom. **Late submission will not be graded.** The due dates will be announced during the class. If HW due date does not fall on lecture date, due is at 5:30pm at the instructor's office at WH213 or mailbox at WH 211

**3. Exams** - There will be two in-class exams and final exam given during this course. You must take all tests at their scheduled times.

**4. Course website** - Course website is available at <http://www-woolf.uta.edu/>. The login is "mae3318" and the password is "knemics349".

**6. Academic honesty** - It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Series 50101, Section 2.2)

**7. Students with disability** - The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 - The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability). Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.