ME 314

Design of Machinery

Fall 2009

Instructor. Dr. Gregory P. Starr—I consider myself to be a shadetree mechanic who learned a ~~little~~ decent amount of math; I have always been fascinated with things that *move* (that's why I'm not a civil engineer). My ME office is ME 423 (MTTC 242), phone 277-6298 (272-7156), email address `starr@unm.edu`, office hours by walk-in or appointment. I also have an office in MTTC Suite 235, room 242; I'm usually there on TTh. You can see me there, too (by appointment). Email is the best way to reach me.

Goal of Course. A knowledge of the kinematics and kinetics (dynamics) of machines of mechanisms is crucial for a mechanical engineer. We will primarily learn methods of analysis which are also important for synthesis (design). The subject matter will include linkages (planar), cams, gears and gear trains, and maybe another topic or two. There is much more than we'll have time to cover, so I'll "pick and choose" topics. Finally, after many decades of analyzing mechanisms "by hand," this semester I intend to make much more use of the ADAMS computational package. You're the first class of mine to do this...

Textbooks. Uicker *et al*, Theory of Machines and Mechanisms, 3^{rd} ed. I did not select this book, but it looks okay. I'm a little surprised at the order of its three main sections: (1) kinematics, (2) design, and (3) dynamics. I would have switched sections 2 and 3. Oh well; the three authors are "legendary" so they know best.

Exams/Projects. We will have a couple midterm exams and a final exam, as well as maybe some projects. I've wanted to do a complete kinematic and dynamic analysis of the desmodromic (no valve springs) on my Ducati motorcycle; if we do that I'll bring the cylinder head in so we can examine it. No promises on that, however...

Homework. Selected homework problems will be assigned. I will provide homework solutions for most homework assignments (see "Website" below)—I strongly feel that I shouldn't ask you to do anything I wouldn't do. I will usually have homework "hints and answers" documents available on my website for you to download. This has proven to be quite helpful.

Computer-Aided Mechanism Analysis. After installing Windows on my MacBook Pro laptop, I can now use the ADAMS mechanism simulation package. ADAMS is a very comprehensive package, and we'll definitely use it for many of the homework problems, as well as perhaps a project. I have taught this course now and then since 1978, and I'm *finally* going to incorporate ADAMS in the course. I think you'll appreciate it. We will still learn principles of analysis "by hand," but engineers now use CAD tools such as ADAMS, so you will too!

Website. My website, `www.me.unm.edu/~starr` has a link on the front page to ``ME 314 Design of Machinery''. I will put all homework solutions and programs on this site as soon as you have submitted them to me. I will also have homework "hints" you can download *before* the homework is due. This syllabus is also on that site. Everything is PDF files (well, almost everything).

Grading. The following table shows the approximate weighting used to evaluate your performance in this course:

Homework & Programs	20%
Projects	15%
Midterm Exams	60%
TOTAL	100%

If I don't have projects, I'll just expand all the other items to total 100%. This breakdown is approximate, but it gives you an idea.

Mailing List (listserv). Finally, there is a "mailing list" associated with this class, `ME314-L`, to which you should all sign up. I will be mailing information regarding the class, and it is important that you receive it.

Use the standard procedure to join the list:

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HOW TO SUBSCRIBE TO THE LIST

        Individuals can subscribe to the list by sending a message to:

          listserv@list.unm.edu

        Leave the Subject field blank.

        In the body of message type (with no other text):

        subscribe ME314-L Firstname Lastname

        Once the subscribe request is approved, a notification will be
        emailed to the person.
```