



MACHINES — 2009

COURSE SYLLABUS

OVERVIEW:

This course on machines is directed towards future managers and users (rather than designers) and will have a bias towards the machines used for wood products manufacturing. The course will cover:

- Machine asset maintenance management, reliability and safety, purchasing, installation.
- Machines functions and the major assemblies such as frame, drive, and control.
- The analysis and selection of machine components such as fasteners, bearings and springs.
- How machines are developed, designed and built.

It is assumed that each student has a basic knowledge of physics, mechanics, strengths of materials and material properties. Prerequisite: WOOD 376. Co-requisite: WOOD 386

LEARNING OBJECTIVES:

Upon successful completion of the course, you should be able to:

- Identify the major types of functional components of a machine and know how they work
- Create a budget for machine purchase, operation and maintenance
- Write specifications for tender and purchasing a machine
- Complete an FMECA for a machine
- Select a suitable maintenance program
- Size and select welds, fasteners, bearings, gear trains, belts, chains, couplings, and shafts for the purpose of making decisions about machine acquisitions, maintenance, or improvements
- Understand and design machine safety labeling for safe operation
- Choose design safety factors
- Balance a machine in a single plane
- Source machine components
- Recognize several methods of controlling machine noise
- Judge the appropriateness of machine designs and maintenance taking into account the situation in which the machine will be used.

CLASS LOCATION:

- Lectures: MWF, 1100-1200 Location: CAWP, CASE Room
- Labs : Th, 1500-1800 CAWP, SIM Lab

GRADING POLICY:

IRAP	(Individual)	15%
GRAP	(Team)	15%
Assignments and classwork	(Team)	20%
Midterms (2 x 10%)	(Individual)	20%
Final Examination	(Individual)	30%
	Total	100%
Participation		50% to 120%

This will be used as a multiplier of the team marks and based on anonymous peer review.

TEXTBOOK:

Required:

1. **Mott, Robert L., *Machine Elements in Mechanical Design*, 4th ed., Prentice Hall, Upper Saddle River, 2003 UBC Book Store**

References:

2. Juvinall, Robert C. and Kurt M. Marshek, *Fundamentals of Machine Component Design*, John Wiley & Sons, New York.
3. Shigley, Joseph E., Charles R. Mischke, and Richard G. Budynas, *Mechanical Engineering Design*, McGraw Hill, New York



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WEB PAGE: The course will be supported by a Vista page with announcements, lecture notes, and quizzes and exams from previous years. Ensure you have access. Ordinarily the solutions to the RAP and assignments done in class will not be posted as these will be discussed in class.

E-mail COMMUNICATION:

- Please use only "MECH 356" as the subject line of all correspondence. These will be top priority.
- Replies from the instructors will be sent to the e-mail address from which they came.
- Original e-mails from the instructors will be sent to the address provided by the registrar's office.
 - If you do not receive e-mails please log onto the Student Service Centre, go to "Email Change".

TEAM BASED LEARNING, TBL:

This year, for the first time, we will be using Team Based Learning techniques in MECH 356. Loosely, TBL is way of structuring the classes so that we can work at a higher decision making level than is traditionally done in Lecture based classes. It promises to be a pleasurable experience and you should complete course with a better and more useful understanding of the course material as well as improved team working skills. The second lecture period will be devoted to explaining the process.

LABS AND TUTORIALS:

Most of the scheduled Lab sessions will be used for tutorials covering the assignments.

READING ASSIGNMENTS:

Reading assignments will be completed out of class and will be assessed at the beginning of the modules.

TEAMS:

The class will be divided into teams of 5 to 6 students each and will remain in these teams for the duration of the term.

PARTICIPATION GRADING POLICY:

Most, if not all, assignments will be completed in class, and in teams, and credit will be given only to those students who attend and sign the work. The contribution of each student will be assessed by the other team members and this will be used as a multiplier applied to the team marks. Peer assessment will be anonymous.