ETME 341 – MACHINE DESIGN            SPRING 2014

LEC (001) - 8:00 M W F   (RH 301)
LAB (002) – W  4:10 – 6:00 pm (EPS 008F)
LAB (003) – M  10:00 – 11:50 am (EPS 008F)
LAB (004) - Th  1:10 –  3:00 pm (EPS 008F)

Instructor: Kevin R. Cook  Phone: 994-6503
Office: Roberts Hall 203   E-mail: kcook@me.montana.edu
Office Hours: see schedule on D2L site

PREREQUISITE: ETME 340 or equivalent.


COURSE DESCRIPTION: This course is designed to provide an overview of the concepts, procedures, analysis techniques, and application techniques necessary to design machine elements commonly found in mechanical devices and systems.

Course Website: Log into D2L: https://ecat.montana.edu/

Specific Course Outcomes:

Upon completion of this course, students should be able to:

- Demonstrate required proficiency in math to solve machine design related problems
- Properly select materials for machine design components
- Apply appropriate stress analysis techniques in order to effectively and safely design machine elements
- Apply specific machine component design processes to effectively and safely design machine elements
- Communicate the design intent of mechanical components effectively through CAE techniques
- Complete laboratory experiments / assignments requiring appropriate data collection, synthesis, interpretation and presentation
- Effectively integrate machine components into an operational machine system.
- Demonstrate the ability to work cooperatively and interactively with others in a team environment to complete a given design project
- Be familiar with the design resources and journals available in order to maintain currency with new technology and apply new methods and techniques to design processes and products in industry

Topics Covered:

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STUDENT EVALUATION:

The student will be evaluated for a final course grade based upon the “Inspection Model” where the score distributions are evaluated at the end of the semester for natural breaks or cut-offs. Note that this is not a “curve” grading system. Your final grade will be based upon where you fall in the score distributions and my subjective evaluation of total class performance. Grading will be distributed as follows:

1. Exams/Final Exam  50%
2. Lab Work / participation  25%
3. Homework / quizzes  25%
Internet Course Site
I expect that you will check the course website: (located in D2L: https://ecat.montana.edu/) on a daily basis in order to keep current with course announcements, assignments, schedule changes, etc.

Student Educational Records

All records related to this course are confidential and will not be shared with anyone, including parents, without a signed, written release. If you wish to have information from your records shared with others, you must provide written request/authorization to the office/department. Before giving such authorization, you should understand the purpose of the release and to whom and for how long the information is authorized for release.

Students have the right to access their educational records by appointment. This information is protected by the Family Educational Rights and Privacy Act (FERPA). For more information contact the Dean of Students office at 994-2826.

Conduct Guidelines and Grievance Procedures for Students:

Refer to the following policy for MSU Student Conduct Code:

http://www2.montana.edu/policy/student_conduct/student_conduct_code.htm

Lab, Homework Problem, and Design Assignments: Homework Problems and Design Projects will be assigned from the text and other supporting materials as the course progresses. The lab work required each week will be specified in lab assignments. These assignments will be posted on the course website for students to review. When appropriate, paper copies will also be handed out. The requirements for communicating the results of these assignments will be specified in the assignment as well. Content of these assignments will be reflected on the quizzes and examinations. Completed assignments are due at the beginning of class or lab on the due date (unless otherwise specified by the instructor). Late assignments will be accepted up to 24 hours after the assigned time and date with a 15% reduction. No assignments will be accepted after that point unless prior arrangements are made with the instructor. Assignments must also conform to the following criteria:

✦ Written communication (lab and design project reports) must conform to proper communication standards and expectations of junior level engineering students (see page 3)
✦ Problem solutions (lab and homework) must include all elements of the scientific problem-solving method.
✦ Use plain white paper or engineering paper for all solutions
✦ Use only one side of the paper
✦ Answers and process must be communicated effectively and legibly

Lab Sessions: The lab portion will complement the course subjects through the use of:

✦ hands-on experiences
✦ computer software usage (MDSolids, SolidWorks, etc.)
✦ computer program development (excel, mathCad, etc.)
✦ group and individual design projects

Therefore, attendance at all sessions is mandatory unless otherwise specified by the instructor. Also, everyone is to respect the value of each others time and be on time! Attendance will be taken and will contribute to your overall lab grade.
Communication in Mechanical Engineering Technology

*Technical Writing* is a necessary and fundamental skill required of all engineering technology students. In fact, the ability to communicate effectively through written media is one of the most important skills that you will develop here at Montana State University. Important outcomes of the MET program include the following:

- ABET outcome g: “an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature”
- MET program outcome #7: “Communication: Demonstrate appropriate written, oral, computer, and technical skills to effectively communicate with individuals having a broad range of backgrounds and experience.”

Practice throughout the curriculum is essential to master this skill, and thus, each student must take every opportunity seriously and work to improve their communication abilities. Employers consider this ability essential, and it is often what sets applicants apart in the interviewing process.

The information below will provide some guidance to material that, if used, can help each student become a better writer and technical communicator. Please use these materials, along with a consistent proofreading process, while completing writing assignments in this course.

- M&IE Engineering Communications TOOLKIT: [http://www.coe.montana.edu/StudentWritingAid/home.html](http://www.coe.montana.edu/StudentWritingAid/home.html)
- MSU Writing Center: [http://www.montana.edu/writingcenter/index.html](http://www.montana.edu/writingcenter/index.html)
  - Various technical writing textbooks and guides are available
- Internet sources: Many are available.
  - Example: [http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf](http://web.mit.edu/me-ugoffice/communication/technical-writing.pdf)

Every engineer will be required to communicate through the written language. As you progress through your MET program, take every writing assignment seriously. Every assignment will be a little easier than the last, and, eventually, your writing will become a great asset to you and your success in the future.