EGM 3520: Mechanics of Materials
Spring 2011 Syllabus – Course Section 1585

Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course web site and announced in class.

Catalog Description: Credits: 3; Stress and strain at a point, stress-strain-temperature relations and mechanical properties of materials. Systems subject to axial load, torsion, and bending. Design concepts, indeterminate structures, and applications.

Pre-requisites and Co-requisites: Prerequisites: EGM 2511 (or EGM 2500) and MAC 2313.


Instructor: Dr. Curtis R. Taylor, Ph.D., Assistant Professor, Department of Mechanical and Aerospace Engineering, curtis.taylor@ufl.edu, MAE-B 224, 392-4440, Office hours: MThF 3-4 p.m.

Lecture times and days: 7th Period MWF (FLG 220)

Teaching Assistant Office Hours: Office hours with teaching assistants will be available. Location and schedule will be posted on the course website.

Course Online Resources: E-Learning/Sakai system (https://lss.at.ufl.edu/)—all documents, homework, grades, etc. will be posted on this system.

Course Objectives: The purpose of the course is to provide students with the means of analyzing and designing various machine and load bearing structures. Upon completion of this course each student should have:

1. Basic understanding of engineering mechanics and the ability to apply this understanding to analyze and solve a given problem.
2. Basic understanding of material properties and mechanical deformation.
3. The ability to apply advanced science and engineering principles in the design and analysis of structures to support loads within a given limit of safety.

Contribution of course to meeting the professional component: EGM 3520 supports several program outcomes enumerated in the Mission Statement of the Department of Mechanical and Aerospace Engineering (MAE). Specific MAE program outcomes supported by this course include: Being able to work professionally in mechanical systems areas including the design and realization of such systems. (ME Program Outcome M4).

Mathematics (25%), Engineering Sciences (50%), Engineering Design (25%)

Relationship of course to program outcomes: This course achieves the following Accreditation Board for Engineering and Technology (ABET) outcomes [note that the outcome number corresponds to the respective ABET outcomes (a) through (k):

- (a) Apply knowledge of mathematics, science, and engineering [high coverage; method of assessment is homework and four exams to measure Outcome (a)]
- (c) Design a system, component or process to meet desired needs [low coverage; method of assessment is homework and exam problems related to design of trusses, frames and machines for desired functionalities]
- (e) Identify, formulate, and solve engineering problems [high coverage; method of assessment is homework and four exams to measure Outcome (e)]
• (f) Understand professional and ethical responsibilities [medium coverage; method of assessment is class examples and homework assignments of practical applications and designs involving professional engineering ethical application of proper engineering principles learned in statics]
• (k) Use the techniques, skills and modern engineering tools necessary for engineering practice [low coverage, no formal assessment to measure Outcome (k)].

Assessment Methods: Your grade for this course will be determined based on your performance on homework, quizzes, and exams as follows:

Homework  20%  
No late homework accepted. Homework is collected on the assigned dates in the first 5 minutes of class. Working in groups is permitted. However, copying homework is NOT permitted. Written homework must adhere to the following format. It should be on engineering paper, with your assigned sorting number (to be given after 1st homework assignment) in the upper right corner, with a clear problem statement, appropriate free-body diagram, and the solution with appropriate significant digits inside a box. Use of solutions manuals to complete homework is considered cheating and a violation of the honor policy, and will be fully enforced.

Homework will be graded ‘lightly’ -- each problem will be scanned for relevance and reasonableness and given a grade of 0, 1, or 2. Two problems per week will be graded in detail on a basis of 0 to 5. The TAs will grade your homework.

Homework in this class is VERY IMPORTANT. The homework is not considered as an aid to help you prepare for tests. The problem solving skills you develop in doing the homework are skills that are difficult to test in an exam. They are much more like the skills you will need in the real world than those you develop in preparing to take an exam. Also, communication skills are important in the real world, not just answers. Your TAs have been instructed to look for explanations, not just answers.

Quizzes  15%  No makeup quizzes allowed. Quizzes will be given in the first 15 minutes of class on assigned days.

Exams          40%  \ Exam dates will be announced at least one week in advance.\n
Final Exam  25%  

Grading: Students will receive a course grade of A, B, C, D, or E. There will be no plus or minus grades given. Grading will not be on a pre-specified curve. There are absolute expectations. I will assign a grade level for each category (homework, exams, etc.) and then add them up to get a grade level for your final grade. These levels may be adjusted somewhat as I evaluate the class’s performance.

Please notice that there is no connection between any of the grade assignments and the traditional numbers “90, 80, 70, ….”. If you persist in trying to make that connection you will be very confused and may be misled by your grade. For example, in a given category the cutoff for an A could be 94%, an A on a midterm could be 65-70%, or passing the class could require 75%.

Course Topics:
Chap 1 Concept of Stress
Chap 2 Stress and Strain
Chap 3 Torsion
Chap 4 Pure Bending
Chap 5 Analysis and Design of Beams for Bending
Chap 6 Shearing Stresses in Beams and Thin
Chap 7 Transformations of Stress and Strain
Chap 8 Principal Stresses Under a Given Loading
Chap 9 Deflection of Beams
Chap 10 Columns
**Attendance and Expectations:** Even though attendance is not required, it is extremely important that students attend the class regularly. If you miss a lecture you are responsible for finding out from a classmate what we did in class. Irregular attendance always results in poor or mediocre performance. Pop quizzes will be given throughout the semester.

**Re-grading Policy:** Any re-grade requests must be submitted in writing within one week after return of the graded paper. The written request must explain in detail what you want the grader to do and where you believe he has made a mistake in grading. The request must have a date on the top of the page, your name, your telephone number(s), and e-mail address.

**Miscellaneous Policies:** Students will be held responsible for knowledge of all scheduling and policy announcements made in class. If you send an email please also list a phone number where you could be reached.

**Make-up Exam Policy:** Unless there is a documentable extreme medical emergency or family crisis, no credit will be given for a missed exam. It is the student’s responsibility to make sure he/she is available to take the exam.

**Honor Policy:** Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action. Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code. All work submitted in this course must be your own and produced exclusively for this course. The use of sources (ideas, quotations, paraphrases) must be properly acknowledged and documented. For the copy of the UF Honor Code and consequences of academic dishonesty, please refer to http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php. **Violations will be taken seriously and are noted on student disciplinary records.** If you are in doubt regarding the requirements, please consult with the instructor before you complete any requirement of the course.

**Accommodation for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

**UF Counseling Services:** Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling

**Software Use:** All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and peers to the highest standards of honesty and integrity.