UNIVERSITY OF ARIZONA
Department of Civil Engineering and Engineering Mechanics

CE 215 - MECHANICS OF SOLIDS – Fall 2017

Catalog Description: (3 units) Material behavior; relationship between external forces acting on elastic and inelastic bodies and the resulting behavior; stress and deformation of bars, beams, shafts, pressure vessels; stress and strain; combined stresses; columns.

Instructor: George N. Frantziskonis, Room 206A, Civil Engineering Building
Phone: 621-4347
Email: frantzis@email.arizona.edu, http://www.u.arizona.edu/~frantzis/
Lecture: MoWeFr 11:00am-11:50am Education, Room 353
Office hours: Mo 1:00 –2:00pm, We 1:00-3:00pm. See TA office hours for recitations and homework.

Teaching Assistant: Sarah Ruth Merrigan, Room 214, Civil Engineering building
Email   srmerrigan@email.arizona.edu
Office hours   MoWe 1:00pm – 3:00pm (also see D2L main page)
Recitations   Mondays, 4:00PM - 4:50PM, Chavez room 307
                    Wednesdays, 3:00pm - 3:50pm, Mines & Metallurgy, room 221
                    Fridays, 2:00pm-2:50pm, Harvill room 130

Prerequisite: CE 214 – Statics

Textbook: Essentials of the Mechanics of Materials, by G. N. Frantziskonis, 3rd Edition, DesTech Publications (electronic or hard copy version).

Weights for course grade:
10 points – homework,
54 points – 3 tests @ 18 points each,
31 points – final exam,
5 points attendance (main lecture and recitations)

Scale for final grade: A Outstanding   90 - 100
                               B Above Average 80 < 90
                               C Average   70 < 80
                               D Below Average 60 < 70
                               E Failure   < 60

The cutoffs for grades may be lower, but will not be higher (I will not raise the standards mid-semester). The course grades are not curved. I feel very strongly that learning should be measured with a standard (maybe a high standard, but a standard none the less) and that you should not be directly competing with anyone other than yourself. I fully expect everyone in the course to be successful and if you are having problems, then you must initiate a process for improvement.

COURSE CONTENT

Week of		ARTICLES
Aug.	21	Axially Loaded Bar, Normal Stress, Normal Strain, Uniform and Non-uniform Stress and Strain, Hooke's Law, Spring Analogy
	28	Poisson Effects, Safety Factor, Non-uniform Bars
Sept.	4	Statically Indeterminate Bars, Temperature Effects, Shear Stress
	11	Shear Strain, Shafts, Review

Exam 1 Monday Sep. 18

	18	Shafts, Non-uniform Shafts, Shear Modulus
	25	Beams, Shear Force and Bending Moment Diagrams
Oct.	2	Beam Deflection and Curvature, Normal Stresses in Beams
	9	Shear Stresses in Beams, Shear Flow, Plane Stress
	16	Stress Transformation, Extreme Stresses, Mohr's Circle

Exam 2 Monday Oct. 23

	23	3-D Stresses, Generalized Hooke's Law, Pressure Vessels
	30	Combined Stress, Beam Theory
Nov.	6	Beam Deflection, Statically Indeterminate Beams, Superposition
	13	Compatibility Conditions, Combined Stress and Beam Deflection Review

Exam 3 Wednesday Nov. 15

	20	Buckling and Stability
	24	Uncovered Material, Review
Dec.	4	Review

Final Exam Wednesday: 12/13/2017 10:30am - 12:30pm (see also final exam schedule in UA pages)

HOMEWORK

Homework problems will be collected, graded and returned. Homework is to be done in a neat, orderly fashion on Engineering Problem paper using only one side of a sheet. Homework is due at the beginning of the period in which it is due or as mentioned orally in class. Late homework is not accepted for any reason and receives a grade of zero.

A problem statement in sufficient detail must precede each problem solution so that grading can be done without reference to the textbook. The purpose of the problem statement is to ensure that the problem is understood.

Failure to comply with the policy on homework may result in downgrading and/or refusal to accept the work.

EXAMINATIONS

You must take three examinations during the semester and a final examination. All examinations will be held during the regular class session in the lecture room assigned to this course. All exams are closed book and calculators are permitted. However, only calculators approved by the Civil Engineering department are allowed. A list of approved calculators will be emailed to all students shortly. The list can also be found in:
http://ncees.org/exams/calculator/

No credit is given for correct answers obtained by incorrect reasoning and/or compensating errors. Partial credit will be given for work that pertains to the correct solution. The final exam is mandatory and there will be no change in time as this would be a violation of University policy. A similar policy holds in this class for the tests, yet under exceptional circumstances other arrangements may be made, on a case-by-case basis. There will be no make up for missed examinations. The final examination score will be adjusted for, at most, one acceptable excused

missed examination. An unexcused missed examination or a second missed examination is scored as zero.

Examinations are regarded as engineering reports. Procedures and presentation of solutions should be precise and legible. Penalties are assessed for:

        (I)   algebra and arithmetic errors;
        (II)   answers presented without proper units, sign or direction;
        (III)   incomplete free body diagram; and
        (IV)   messy or illegible presentation.

A summary of your grades will be posted regularly in D2L. You must check that your grades are correct. You must notify the instructor of any omission or error within 10 days after grades are posted. Changes may not be accepted after that.

ACADEMIC INTEGRITY

One sanction for dishonest academic work permitted under the University CODE OF ACADEMIC INTEGRITY is a failing grade in the course. The grade of E will be assigned for dishonest academic work.

ATTENDANCE POLICY

The following is the University policy on absence:

Students are expected to be regular and punctual in class attendance. The University believes that students themselves are primarily responsible for attendance. Instructors will provide students with written statements of their policies with respect to absences. Excessive or extended absence from class is sufficient reason for the instructor to recommend that the student be administratively dropped from the course. For those courses in which enrollment is limited, missing the first day of class session may be interpreted as excessive absence. If this action is filed in the Registrar's Office by the end of the fourth week of classes, it will result in cancellation of registration in the course. If the student is administratively dropped after the end of the fourth week of classes, it will result in a failing grade being awarded in that course.

Policy of this class:

- If you need to be absent from the class for justifiable reasons (sickness, emergencies, etc.), you must inform the instructor in advance or immediately after the day of absence.
- It is required that you attend all classes and recitations. The instructor may report to the Registrar's Office if absence is excessive, which may result in administrative drop from the class. Attendance accounts for 5% of the course grade.

Auditors are also expected to attend the classes.

THIS POLICY WILL BE STRICTLY ENFORCED.