Statics
ENGR 2053/4
Rationale

Credit Hours: 3
Instructor: Dr. Nels Madsen and Dr. Dan Marghitu
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Prerequisite: Engineering Physics – Introduction to Newton’s Laws, gravitation, cosmology, conservation of energy, momentum and angular momentum, special relativity, and fluids using introductory calculus - PHYS 1600 (Auburn University)
Co Requisite: Calculus III – Multivariate calculus: vector-valued functions, partial derivatives, multiple integration, vector calculus - MATH 2630 (Auburn University)

Required Materials:

- Lecture Notes on the Blackboard

Recommended Materials:

- Statics eBook by Dr. Kurt Gramoll available at https://ecourses.ou.edu/cgi-bin/ebook.cgi?doc=4358fcd905d4588c.eml&topic=st
- University of Missouri Rolla http://web.umr.edu/~mecmovie/index.html

Course Overview:

Engineering mechanics involves the development of mathematical models of the physical world. Engineering mechanics addresses the forces acting on and in mechanical objects and systems, and the impact those forces have on the motion, or lack thereof, of those systems. The class deals with the understanding of the mechanical behavior of complex engineering structures and components. We want to discuss the tools of formulating the mathematical equations and also the methods of solving them. Also included are numerical methods for solving the static problems using computer programs.

This class provides a thorough, rigorous presentation of statics, augmented with proven learning techniques for the benefit of instructor and student. The first objective is to present the topics thoroughly and directly, allowing fundamental principles to emerge through applications. The topics are vectors, forces, moments, free body diagrams, force systems, 2-D and 3-D equilibrium, friction, and geometric properties of plane areas. We
emphasize concepts, derivations, and interpretations of the general principles.

**Activities:**

The online section of the on-campus course ENGR 2050 Statics and its distance education counterpart ENGR 2053/2054 are identical. Online students will have live, interactive, access to the course instructors via the web. Both the courses consists of 7 topics spread across 15 weeks of instruction. The distance learning course has 7 quizzes, 13 homework assignments, two tests and a final examination. At the beginning of the course, the learners will view a course introductory video lecture where they are introduced by the instructor to of the various components of the course. At the end of each topic, there is a quiz. At the end of each session, there is a homework assignment. For each topic, the learners are required to study from the lecture notes, and do the assigned reading, and homework assignment. Sometimes the distance learning students are expected to watch videos of instruction. This part is being developed to address the face-to-face interaction in a regular classroom.

**Assignments:**

On-campus and distance education students in the online sections will have the same homework assignments. These will consist of problems assigned from the text and other sources. Every homework assignment and quiz provides them with necessary understanding of the concepts that are being presented on a particular topic. They are very engaging and require students’ undivided attention to work on the problems.

**Methods students will use to interact with the professor:**

Students in the online sections will have live two-way access to all classroom activities via the internet. Recorded versions will also be available. The instructors will be available via e-mail and also have scheduled phone and computer access hours.

**Evaluation:**

Assignments are the same for both the on-campus and distance education students. Students are expected to read from the text book, and the lecture notes made available on the course website in Blackboard each session. They are also expected to complete a home work assignment. At the end of each topic, they have a quiz. Both the students have two tests and a final proctored examination. They will be evaluated identically. This includes homework and quizzes, 20%, exams, 40%, and a final, 40%.
Final Exam:

The distance students will take a proctored final exam. This comprehensive exam is designed to give the students an opportunity to review all that they have learned until this point in time. It includes mainly of problems to solve and some short answer questions.

Final Exam Process:

After the first session, the student must select a proctor to supervise the final examination. Examples of approved proctors are academic administrators in the learner’s locale: school superintendents or principals, academic deans or department heads at colleges, or an independent learning office test supervisor at another college, or an education officer at a military installation. All proposed proctors are verified for appropriateness by Distance Learning and Outreach Technology (DLOT) student services staff at 334-844-3106 or audl@auburn.edu. At the time of the final examination, the proctor and the student fill out the Examination Information Verification form. This form along with any written material is mailed in a confidential self addressed sealed envelope to DLOT office. When the examination is received by DLOT, the staff records it and forwards it to the faculty for grading and reporting.

Text Materials:

The textbook and reading requirements are the same for both the courses.

Course Description, Objectives, Grading and Syllabus:

See the syllabus and schedule.