

ARIZONA WESTERN COLLEGE  
SYLLABUS

## EGR 188 FUNDAMENTALS OF ENGINEERING DESIGN

Credit Hours: 4 Lec 3 Lab 2 (On Line)

PREREQUISITES: MAT 151 plus MAT 183 or MAT 187 or approved higher level math course

COURSE DESCRIPTION

Engineering design, effective team participation and career preparation. Students are expected to participate in hands-on design projects, develop education/career plans and initiate development of the personal and management skills necessary for life long learning.

1. COURSE GOAL

This course introduces students to the methods used by engineers to approach and solve problems. It also increases students' awareness of, and interest in, the types of problems that confront engineers.

2. OUTCOMES

Upon satisfactory completion of this course, students will be able to:

- 2.1. exhibit the behaviors associated with taking personal responsibility for time management, learning new material, setting goals, etc. in completing assigned work.
- 2.2. demonstrate the fundamentals of organizing and presenting technical work.
- 2.3. demonstrate the ability to perform technical work and resolve conflicts in groups and teams.
- 2.4. develop and demonstrate the behaviors of effective problem solving.
- 2.5. create useful representations of artifacts and processes.
- 2.6. demonstrate a working knowledge of the role of the customer in defining quality.
- 2.7. demonstrate the ability to meet customer-defined specifications.

3. METHODS OF INSTRUCTION

The course uses a number of active learning procedures, student teams, and the concept of continuous improvement of the learning process. Constructivism has also been used in developing a number of in-class activities. The students, who participate, even when they occasionally falter, have a much easier and more enjoyable time in class than students who resist participating. Participation has, in fact, been included as part of your course grade. A number of problems and projects will be assigned. Specific expectations for these assignments will also be provided to monitor the successful completion of these assignments.

Students can expect:

- 3.1 to develop and/or improve upon their skills of using the Internet for course materials and for successfully completing and communicating assignments and projects.
- 3.2 to develop and/or improve upon their skills of using computing resources to successfully complete assignments and projects.
- 3.3 to actively discuss course material amongst small team members and with the entire class during each class meeting.
- 3.4 to be given problems the student thinks he/she does not know how to solve.
- 3.5 that some of the classroom instructions will not be specific, for the purpose of developing problem solving skills.
- 3.6 to find that other students will have different interpretations of what is expected during class.
- 3.7 to be a team leader, team recorder, and team member at different times during the semester.
- 3.8 that the course faculty will ask the student to help other students understand course material.

- 3.9 to suggest ways to improve the class.
- 3.10 to be asked by other team members to modify the way they behave.
- 3.11 to be actively involved in learning activities during most class periods and online interactions outside the scheduled class sessions.

#### 4. LEARNING ACTIVITIES

- 4.1 Team-based Projects:  
At least two engineering design projects covering one or more of the following or similar topics:
  - dissect and reassemble artifact
  - develop an assembly plan (process)
  - assemble and index a design notebook
  - design, build, and test a device
  - demonstrate design
- 4.2 Mathematical Models:  
Conceptualize and develop solutions to various problems covering at least three different types of mathematical models, such as: time-varying problem, statistical problem, mixing problem, optimization problem, simulation problem, and risk problem.
- 4.3 Educational and Career Plan:  
Analyze your personal strengths and weaknesses against anticipated opportunities and threats, and formulate your individual educational and career plan.
- 4.4 Notebook / Portfolio:  
Document your course activities for periodic review and evaluation by self, peers, and instructor.

#### 5. EVALUATION

- 5.1 Behaviors associated with taking personal responsibility for time management, learning, comprehending, and applying new material learned, setting goals, and working towards their accomplishment will be evaluated, amongst others, by (a) monitoring and evaluating the students' classroom participation, and (b) by periodically reviewing the documentation on various course activities as compiled and organized by the student in the form of a note book/portfolio.
- 5.2 Projects will be evaluated based on defined specifications and expectations both in regard to the contents and the presentation.
- 5.3 Development of mathematical models will be evaluated based on defined specifications and expectations, both in regard to the contents and the presentation.
- 5.4 Quizzes will be used to evaluate the understanding of knowledge gained, the comprehension of concepts covered, and their application in solving problems.
- 5.5 Formulation of the student's individual educational and career plan will be evaluated based on defined specifications and expectations.

#### 6. STUDENT RESPONSIBILITIES

- 6.1 Under AWC Policy, students are expected to attend every session of class in which they are enrolled.
- 6.2 If a student is unable to attend the course or must drop the course for any reason, it will be the responsibility of the student to withdraw from the course. Students who are not attending as of the 45th day of the course may be withdrawn by the instructor. If the student does not withdraw from the course and fails to complete the requirements of the course, the student will receive a failing grade.
- 6.3 Americans with Disabilities Act Accommodations: Arizona Western College provides academic accommodations to students with disabilities through AccessABILITY Resource Services (ARS). ARS provides reasonable and appropriate accommodations to students who have documented disabilities. It is the responsibility of the student to make the ARS Coordinator aware of the need for accommodations in the classroom prior to the beginning of the semester. Students should follow up with their instructors once the semester begins. To make an appointment call the ARS

front desk at (928) 344-7674 or ARS Coordinator at (928) 344-7629, in the College Community Center (3C) building, next to Advising.

- 6.4 Academic Integrity: Any student participating in acts of academic dishonesty—including, but not limited to, copying the work of other students, using unauthorized “crib notes”, plagiarism, stealing tests, or forging an instructor’s signature—will be subject to the procedures and consequences outlined in AWC’s Student Code of Conduct.
- 6.5 Texts and Notebooks: Students are required to obtain the class materials for the course.
- 6.6 Arizona Western College students are expected to attend every class session in which they are enrolled. To comply with Federal Financial Aid regulations (34 CFR 668.21), Arizona Western College (AWC) has established an Attendance Verification process for “No Show” reporting during the first 10 days of each semester.
- Students who have enrolled but have never attended class may be issued a “No Show” (NS) grade by the professor or instructor and receive a final grade of “NS” on their official academic record. An NS grade may result in a student losing their federal financial aid.
- For online classes, *student attendance in an online class is defined as the following* (FSA Handbook, 2012, 5-90):
- Submitting an academic assignment
  - Taking an exam, an interactive tutorial or computer-assisted instruction
  - Attending a study group that is assigned by the school
  - Participating in an online discussion about academic matters
  - Initiating contact with a faculty member to ask a question about the academic subject studied in the course