

ABEN 255 Computer Aided Analysis and Design

Course Description:

ABEN 255. Computer-Aided Analysis and Design. 3 cr. Application and use of software for engineering design, analysis, and graphical communication.

Meeting Times: 9:30 to 10:45 a.m. on Tuesdays and Thursdays. See the attached sheet for a tentative schedule.

Location: IACC 114.

Instructor: Dr. Dean D. Steele 701-231-7268
Dean.Steele@ndsu.edu 113 ABEN Building
<http://www.ageng.ndsu.nodak.edu/personnel/steele.htm>

Office Hours: Tuesdays and Thursdays, 2:30 – 3:30 p.m.; and by appointment. Variations in this schedule will be announced in class, via Blackboard, and/or via e-mail. You may also check with a staff member in ABEN 100 for variations in this schedule.

Texts/Software: Steele, D.D. 2009. *Engineering Problem Solving with Excel*. Fargo: N. Dak. St. Univ.
(This text is required and consists of course notes, software instructions, problem sets, etc. related to engineering problem solving with Microsoft Excel. We will use this text for approximately the first half of the semester and you should bring it to class. The text is sold at roughly its cost for printing and Bookstore markup and the instructor receives no profit on its sale.)

Hamad, M.M. 2010. *AutoCAD 2010 Essentials*. Sudbury, Massachusetts: Jones and Bartlett Publishers. ISBN# 978-0-7637-7629-9.
(This text is required and consists of introductory-level instruction in the use of Autodesk AutoCAD® software. The text will be used for the second half of the semester and will not be used until approximately early to mid October.)

Autodesk. 2009. *Student Engineering & Design Community*. Available at <http://students8.autodesk.com/?lbon=1>. Accessed 18 Aug 2009.
[Please note that student editions of Autodesk software are optional for this course. The NDSU computer clusters have copies of AutoCAD 2010 software available for your use. In personal correspondence with the instructor (6 Aug 2009), Kelly Thompson of Jones and Bartlett Publishers stated, "...your students would be eligible to participate in the Autodesk [online student community](#), and would have access to the student versions of the AutoCAD materials for the duration of your class. They must register using their school appointed email address (must include an 'edu') in order to be eligible."]

Materials: Students will need an e-mail account, access to the Internet, portable media storage devices such as USB flash drives, a scientific or engineering calculator with its manual, and a folder or notebook for notes and handouts.

Objectives: After completing this course, students should be able to:

1. Analyze and interpret data using techniques such as descriptive statistics, histograms, and regression analysis (ABET-a, b, l).
2. Communicate effectively using appropriate graphs, tables, drawings, letters, memos, and e-mail (ABET-a, g, l).
3. Use spreadsheet and CAD software to develop and document engineering designs and solutions (ABET-a, k, l).

ABEN Department Educational Objectives and Program Outcomes for ABET:

Educational Objective 1: Graduates will become engineers with the ability to use their technical knowledge, design, and problem solving skills throughout their careers. This will be accomplished by ensuring that graduates have ability to:

- a. Apply knowledge of mathematics, science, and engineering.
- b. Design and conduct experiments, as well as to analyze and interpret data.
- k. Use techniques, skills, and modern engineering tools necessary for engineering practice.

Educational Objective 2: Graduates will become engineers who have interpersonal and collaborative skills and the capacity for productive careers. This will be accomplished by ensuring that graduates have:

- g. An ability to communicate effectively.

Educational Objective 3: Graduates will become engineers who can use their disciplinary knowledge, educational depth, and breadth to deal with changing career opportunities in agricultural and closely related biological industries. This will be accomplished by ensuring that graduates have ability to:

- l Apply engineering skills to agricultural, biomaterial, and environmental systems.

Prerequisites: None.

Topics: Use of spreadsheets for engineering design, problem solving, and documentation; technical correspondence; and computer-aided design software (AutoCAD). See also the tentative schedule.

Computer Usage:

Students will use computers for most or all of the homework assignments.

At least one test will be conducted on the computer to test students' software proficiency. Computer usage will not be allowed for some or all of the remaining tests and/or quizzes. The reason for this approach is to test your understanding of concepts and your ability to perform calculations related to the subject matter.

Laboratory Projects:

All of the class periods will be in a computer cluster for hands-on instruction, exercises, assignments, and/or projects.

Last update: 9/28/2009.