

MAE 4344 – Computer-Aided Engineering
Fall 2015

Instructor(s): Bo Yang, Ph.D.

Office Number: 202 ELB

Office Telephone Number: 817-272-9335

Email Address: boyang@uta.edu

Faculty Profile: <https://www.uta.edu/mentis/profile/?8453>

Office Hours: Tu/Th: 2:00 p.m. - 3:00 p.m., or by appointment

Section Information: MAE 4344 - 002

Time and Place of Class Meetings: Tu/Th 12:30 p.m.- 1:50 p.m. at WH 406

Description of Course Content: This course consists of a study of the principles of computer-aided engineering in mechanical and aerospace engineering. Parametric, feature-based solid modeling, kinematics & dynamics of assemblies and finite element modeling for design are considered.

Student Learning Outcomes: Course goals include development of an understanding of the basics of computer aided engineering and its use in mechanical & aerospace engineering practice.

Required Textbooks and Other Course Materials:

Kent L. Lawrence, *ANSYS Workbench Tutorial, Release 14*, SDC Publications, 2012, ISBN: 978-1-58503-754-4 (required)

Kuang-Hua Chang, *Product Performance Evaluation Using CAD/CAE*, Academic Press, 2013 (optional)

Nam-Ho Kim and Bhavani V. Sankar, *Introduction to Finite Element Analysis and Design*, Wiley, 2008 (optional)

Descriptions of major assignments and examinations: There will be two mid-term exams (to be scheduled depending on course progress) and a final exam. There will be a term project across the second half semester and there will be a stand-up presentation at the semester end.

Attendance: Students are required to attend each class. Attendance will be taken and each will be counted as ½ of a quiz in final grade calculation.

Grading: Relative Weighting of the Grades:

Homework	20%
Quizzes	15%
Term Project	15%
Exam-I	15%
Exam-II	15%
Final Exam	20%

Weighted Grade Letter Grade

90 or above	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Make-up Exams: Makeup exams will be given only under extreme circumstances. It is expected that the students will contact the instructor sufficiently in advance of an exam or have sufficient reason that they could not do so. Each student is limited to have **only ONE** makeup exam in the course.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through

a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Academic Integrity: Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

Course Schedule (tentative)

1. CAE Introduction (week 1)
2. FEM Fundamentals (week 2)
3. Solid Modeling Review (week 3)
4. Basic Stress Analysis (week 4, 5)
5. Heat Transfer and Thermal Stress (week 6, Project Proposal due)
6. Surface and Line Models (week 7, Mid-term Exam I)
7. Natural Frequencies and Elastic Buckling (week 8)
8. Nonlinear Problems (week 9)
9. Multi-body Kinematics and Dynamics (week 10, 11)
11. Plane Stress/Strain (week 12, Mid-term Exam II)
12. Axisymmetric and 3D Problems (week 13)
13. Term Project Presentation (week 14, 15)
14. Final Exam (week 16)

Woolf Hall 406 Computer Teaching Lab Policies:

1. WH 406 must be officially reserved for all events including classroom instructions due to the limited classroom space equipped with computers and scheduling logistics. Please see Lanie or Janet for reservation.
2. WH 406 is a computer teaching lab. Faculty and Instructors must be present while students occupy this room. When an instructor leaves the room, students are to leave WH 406 as well. Instructors should encourage students to use WH 320 if needed after class is over. The computer lab in WH 320 is available for MAE student access 24/7.
3. WH 406 doors are not to be propped open. Propped doors are considered a security breach by the UTA Police Department and a hazard violation by the Fire Inspector.
4. Food, drink, and tobacco products are prohibited in WH 406.