



CVEN 302-300
Computer Applications in Engineering and Construction

Summer 2018, MW 12:30-1:50 pm, F 12:30-3:20 pm in CVLB 421

Instructors	: Dr. Kuang-An Chang
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Office Hours	: MW 2:00-3:00 pm or by appointment via email
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Mentor Grader	: Mr. Yicong Cai
Email & Office hours	yicongcai@tamu.edu HEB 215 TW: 3:00-5:00 pm R: 3:00-6:00 pm F: 10:00-11:59 am

Computer Applications in Engineering and Construction. (2-3). Credit 3. Application of computers to solution of civil engineering problems using various numerical methods; structured computer programming; mathematical modeling and error analysis; solution of algebraic and differential equations; numerical differentiation and integration; curve-fitting; root finding. Prerequisites: ENGR 112; MATH 308 or registration therein.

Learning Outcomes. By the end of this course, students will be able to design and implement computer programs consisting of multiple modules of numerical methods to analyze civil engineering problems. To achieve this goal, students will learn to:

- Write simple program modules to implement single numerical methods and algorithms
- Calculate solutions to civil engineering problems using standard numerical methods
- Test program output for accuracy using hand calculations and debugging techniques
- Analyze the applicability and accuracy of numerical solutions to diverse civil engineering problems
- Synthesize multiple program modules into larger program packages
- Distill numerical results into a readable format that answers specific civil engineering analysis and design questions.

ABET Outcomes. This course also contributes to the following ABET-identified outcomes of the civil engineering curriculum:

- Ability to apply knowledge of mathematics through differential equations, science (including physics, chemistry, and one additional area of science), and engineering
- Ability to identify, formulate and solve civil engineering problems
- Ability to use modern tools, techniques, and computation methods necessary for civil engineering practice

Textbooks and Other Resources

There are two required textbooks for this course:

- Chapman, S.J. (2016). *MATLAB Programming for Engineers, Fifth Edition*, Cengage Learning, ISBN 9781305924499.
- Chapra, S.C. (2017). *Applied Numerical Methods with MATLAB for Engineers and Scientists. Fourth Edition*. McGraw-Hill: New York.

To access the online course materials (downloads of assignments, course handouts, related resources), please log in to eCampus (<http://ecampus.tamu.edu/>).

Tentative Course Calendar

The attached table presents a tentative course calendar. In addition to the class meeting times, three important dates should be noted:

- Midterm Exam 1: **Friday, June 22**, 12:30-2:20 in CVLB 421 (Covers through Lecture 14)
- Midterm Exam 2: **Friday, July 20**, 12:30-2:20 in CVLB 421 (Covers through Lecture 29)
- Final Exam: **Tuesday, August 7**, 1:00-3:00 in CVLB 421 (Comprehensive)

Grading

Your final grade will be calculated as follows:

Problem Sets, Class Participation, and Quizzes	8%
Programming Assignments	24%
Midterm Exam 1	20%
Midterm Exam 2	23%
Final Exam	25%

Letter grades will be assigned from your total course score according to 90% to 100%: A, $\geq 80\%$ but $< 90\%$: B, $\geq 70\%$ but $< 80\%$: C, $\geq 60\%$ but $< 70\%$: D, below 60%: F. Please note that programming assignments are 20% of your total grade: please do not neglect this work!

Problem Sets

Problem Sets will generally be assigned each Friday and due on the following Friday before the related programming assignment begins. Solutions will be posted the Thursday before assignments are due.

Homework is an important part of the learning process and should be completed individually. You may ask others for help at places where you have made diligent attempts and have become stumped. You may ask others for confirmation of results at significant milestones in the problem. You may not share computer programs, Word documents, or Excel files. Copying another student's solution, even if you slightly change the presentation will be considered as cheating and given a grade of zero (see Plagiarism statement below). Referring to posted homework solutions is acceptable as long as the work you turn in is your own.

Homework problems must be answered clearly, showing all your work, and should be easy to follow. Where applicable, the solution to each problem should contain:

- A brief statement of the problem
- The general form of the equations used to solve the problem
- An equation with the plugged in numbers and the highlighted solution

Failure to include one of these elements will result in lost credit for the problem. Not all homework problems may be graded.

Unless you have a university excuse (see Absences below), late assignments will not be accepted for credit. Please do not ask for exceptions. Your homework grade will be calculated as the average of your [top eight scores on the nine assigned problem sets](#).

Class Participation and Quizzes

You are expected to attend all classes, turn in all assignments, and complete all exams at their scheduled times. Exceptions are only permitted for university excused absences (see Absences below).

Classes will start on time, and pointers for the homework assignments and last-minute changes to the schedule may be announced in class. It is your responsibility to be in class to receive this information or to get the information from another student.

Quizzes may be given on Fridays and feature a slightly modified problem from the week's homework assignment. Quizzes are closed book and notes. Your quiz grade is factored with your grade for problem sets; hence, timely completion of homework and attendance are essential to success in this class.

Programming Assignments

Programming assignments will generally be assigned each Friday and due the following Friday.

Programming assignments are a significant part of your grade: you should complete all assignments individually or in a group of two (but no more than two), putting forward your best effort, and cheating will not be tolerated. An automated computer program will scan programming submissions and flag similar programs for increased scrutiny by the grader.

As with the homework assignments, you may ask others for help at places where you have made diligent attempts and have become stumped. You may ask others for confirmation of results at significant milestones in the problem. You may not share computer programs, Word documents, or Excel files. Copying another student's solution, even if you slightly change the presentation will be considered as cheating and given a grade of zero (see Plagiarism statement below).

Each programming assignment will specify a format for reporting the results, but will generally consist of a short written memorandum followed by a program listing, code validation calculations, and complete program output.

Similarly to the homework, unless you have a university excuse (see Absences below), late assignments will not be accepted for credit. Please do not ask for exceptions. Your programming grade will be calculated as the average of your [top six scores on the seven assigned programming assignments](#).

Exams

Two 110-minute midterm exams and one 2-hour final exam are scheduled (see attached Course Calendar for scheduling). The grading of the exams will be based on both the approach and the final answer. Exams will be closed book and closed notes. [You may prepare a crypt sheet on the front and back of one page of 8 ½ x 11 paper for each exam](#). You will need a hand-held calculator for each exam. It is your responsibility to ensure that your calculator is working and will perform in the examinations.

Plagiarism and Cheating

“An Aggie does not lie, cheat, or steal or tolerate those who do.” Students are expected to understand and abide by the Aggie Honor Code presented on the web at:

- <http://aggiehonor.tamu.edu/>

No form of scholastic misconduct will be tolerated. Academic misconduct includes cheating, fabrication, falsification, multiple submissions, plagiarism, complicity, etc. These are more fully defined in the above web site. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have permission of that person. Since the problem sets and programming assignments grade for this course is a high percentage of your total grade, no plagiarism or cheating will be permitted in the homework. Violations will be handled in accordance with the Aggie Honor System Process described on the web site.

Absences

The university views class attendance as an individual student responsibility. Students are expected to attend class and to complete all assignments. Instructors are expected to give adequate notice of the dates on which major tests will be given and assignments will be due. For more details, please read Part I, Rule 7 of the Texas A&M University Student Rules at

- <http://student-rules.tamu.edu/>

Please contact me as soon as you know you will miss a class or an exam so that a reasonable alternative can be accommodated. Unexcused absences will result in a grade of zero for the missed work. The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence.

ABET

Students may be asked to allow copies of their assignments and exams to be submitted to the Accreditation Board for Engineering and Technology (ABET) review panel. The purpose of this is to demonstrate to ABET that our stated mission and objectives are being effectively implemented. Names will be redacted, and your grade will not be affected by participation.

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.