

Spring 2018 Course Syllabus for
Computational Methods in EE

*University of Texas at El Paso
College of Engineering
Department of Electrical and Computer Engineering*

COURSE INFORMATION

Course Prefix and Number: EE 4386/5301
Course Website: http://emlab.utep.edu/ee4386_5301_CompMethEE.htm
Meeting day and time: T/R, 9:00am – 10:20am
Room: Phys. Sci. Building, Room 314
Final exam: Tuesday, May 8, 10:00am – 12:45pm
Course designation: EE 4380, EE 5301
CRN: 23615 (EE4386), 21367 (EE5301)
Credit hours: 3
Lecture hours: 3

Catalog Description – A presentation of the fundamental numerical techniques used in engineering, including solution of systems of linear and nonlinear equations, interpolation and curve-fitting, solution of ordinary and partial differential equations.

INSTRUCTOR INFORMATION

Dr. Raymond C. Rumpf

Office: ENGR A-337
Office Hours: T/R, 2:00pm – 5:00pm
Telephone: (915) 747-6958
E-Mail: rcrumpf@utep.edu

COURSE MATERIALS

The following items are required for this course:

- TI85 scientific calculator, or equivalent
- Access to MATLAB 2015 or later.
A manual for this software is available at:
<http://www.mathworks.com/help/techdoc/>
- Engineering graph paper
- Textbook: Numerical Methods for Engineers
Steven C. Chapra
McGraw Hill
ISBN: 0073401064

Students are required to archive their syllabus, lecture notes, homework solutions, and quizzes in a well-organized notebook.



PREREQUISITES

By Course (with grade of “C” or better):

- MATH 2326 – Differential equations
- EE 2353 – Continuous Time Signals and Systems

By Topic:

- Linear Algebra
- Differential equations
- MATLAB
- Basic programming skills

COREQUISITES

None.

COURSE OUTLINE

Topics covered in this course include:

1. Introduction to MATLAB
2. Review of linear algebra
3. Roots of equations
4. Curve fitting
5. Numerical differentiation and integration
6. Finite-difference method
7. Optimization

LEARNING OUTCOMES

By the end of the semester, the student will demonstrate the ability to:

- Use MATLAB proficiently.
- Have a basic understanding of linear algebra and basic matrix operations.
- Find roots of equations.
- Fit curves to data.
- Perform numerical differentiation and integration.
- Solve differential equations using the finite-difference method
- Perform basic optimizations

Contribution to Professional Component

EE-4386 is a senior level core course that will give the student the ability to use a computer to solve engineering problems and analyze data.



Relationship to (ABET) Program Outcomes

- Ability to apply knowledge of mathematics, science, and engineering:
Students use concepts from physics and calculus in the analysis of engineering problems.
- Ability to identify, formulate, and solve engineering problems:
Students solve problems numerically and observe simulations of transmission line problems.
- Ability to communicate effectively:
Students solve problems and give oral individual presentations summarizing their work.
- Ability to use computers to enhance problem solving:
Students will use MATLAB to solve problems and visualize solutions.

RULES AND POLICIES

Grading

Student achievement in the course objectives will be assessed using a combination of homework and exams as well as class attendance and participation. Your course grade will be determined by your weighted performance in the following categories:

Homework	40%	90% – 100% → A
Participation	10%	80% – 89% → B
Midterm Exam #1	15%	70% – 79% → C
Midterm Exam #2	15%	60% – 69% → D
Final Exam	20%	0% – 59% → F

Student grades are protected by the Privacy Act of 1974.

Homework Policy

Homework will be assigned on a weekly basis and graded on a 100 point scale. Homework is due no later than 5:00pm on the assigned due date. Late assignments will not be accepted and will be given a grade of zero. Students must show all work to get full credit on problems. Unless otherwise directed, all calculations should be complete and not contain constants like π , ε , μ , c , η , etc. Students must do their own work on assignments. Assignments that are copied from other students will receive a zero grade and disciplinary action will be pursued. See section on Academic Dishonesty.

Format – Unless otherwise indicated, all homework assignments will be submitted as a single paper document stapled in the upper left corner with no additional binding. The first page must be a cover sheet with the student's name, date of the assignment, course information, and assignment number. No problems or work should appear on the cover sheet. Homework must be professional and of high quality. Your work must be provided in the same order that the problems/questions/tasks were of the assignment were asked. Information must be well organized and the writing must be clear and succinct. Problem number being solved should be clearly identified and final answers to questions should be clearly marked or boxed. Finish all calculations before providing the final answer. That is, do not answer with something like $\sqrt{\pi}$. Instead the answer is 1.7725. All computer codes shall be provided in an Appendix located at the end of the document, not



intermixed with the answers. Failure to comply with formatting will result in points deducted from the score.

Graphics – All graphics produced during this course must be of professional quality and suitable for publication. Diagrams should be made as small as possible while still being understandable and easily viewed. Ensure linewidths are sufficient to be easily visible, but not overpowering. Fonts should be of a professional type and of sufficient size to be easily readable without being overpowering. Axes must be labeled and legends provided for plots conveying multiple pieces of information. Graphics must be of sufficient resolution that they are not pixelated. If submitting your assignments in black and white, be sure the graphics are suitable to be accurately read and interpreted in black and white. To help with producing professional graphics, complete and sign the Checklist for Graphics and Diagrams and attach it to the end of your assignment. The checklist may be revised during the semester so always download the latest version at the following link:

<http://emlab.utep.edu/pdfs/Checklist%20for%20Graphics%20and%20Diagrams.pdf>

Exam Policy

Midterm Exams – Two midterm exams will be given and graded on a 100-point scale. Duration of the exams will be around 1 hour and the time will be strictly enforced. Work on the Exams must be neat and well organized. Unless otherwise directed, all calculations should be complete and not contain constants like π , ε , μ , c , η , etc. The final answer must be boxed and clearly marked. The Exams will be closed book, but calculators and writing utensils are allowed. Exams must be the student's own work and no interaction or copying from other students is allowed for exams. Violations will be prosecuted. See section on Academic Dishonesty.

Final Exam – The final exam will last the entire duration of the time allotted by the University, but no longer. Work must be neat and well organized. The final answer must be boxed and clearly marked. Unless otherwise directed, all calculations should be complete and not contain constants like π , ε , μ , c , η , etc. The final exam will be closed book, but calculators and writing utensils are allowed. The final exam must be the student's own work and no interaction or copying from other students is allowed. Violations will be prosecuted. See section on Academic Dishonesty.

Missed Exams – A missed exam can be made-up ONLY IF: (1) the reason for missing the exam is beyond the student's control, e.g. such as a medical excuse, jury duty, death in the family or automobile accident, or (2) prior consent is obtained from the instructor for missing the exam based on a non-frivolous excuse, e.g. such as a job interview or out-of-town job related travel. In either case, the student must submit a written and signed statement describing the reasons for missing the exam, with appropriate documentation, in order to petition for a makeup exam. **A missed exam will carry zero grade if these conditions are not met.**

Attendance Policy

Students are required to attend class and to show up to lectures on time. The course instructor reserves the right to turn away late comers and to withdraw students from the



course that are repeatedly absent. Students missing more than two lectures should seriously reflect on their commitment to this course, as missing classes is highly correlated with poor performance. Students absent from lecture are still held responsible for all information discussed, homework assigned, and exams administered during that missed lecture. This is not the responsibility of the Instructor. In some cases, absence can be forgiven if coordinated with the course instructor well before the lecture is missed.

Participation Policy

The following items are expected from students as part of their participation grade:

- Attendance: Attendance is required.
- Ask questions. Despite how silly or “dumb” you may think your question is, it is very likely that other students have the same question. Confusion on even small details in course material can cause bigger problems and hold you back. If you are truly embarrassed by your question, send an anonymous e-mail to the course instructor. I promise I will respond!
- Respond honestly to poles and provide real-time feedback to instructor about the course. This will contribute greatly to the quality of the course and your success in it.
- Visit instructor during office hours if needed.
- Treat e-mail correspondence as a professional exchange of information.
- Turn off cell phones, pagers, or anything else that may distract the class.
- Purchase the text book.
- Read assigned sections of the book.
- Bring all of your course materials (text book, notes, pens/pencils, paper, Smith charts, calculator, ruler, compass, etc.) to every class.
- Show proper etiquette during class. Do not talk, make excessive noise, or otherwise distract the class. You will be asked to leave and it will affect your grade.
- Keep the course materials well organized.

ACADEMIC DISHONESTY

As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self responsibility. The assumption that a student’s work is a fair representation of the student’s ability to perform forms the basis for departmental and institutional quality. All students within the Department are expected to observe appropriate standards of conduct. Acts of scholastic dishonesty such as cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in the whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts will not be tolerated. Any case involving academic dishonesty will be referred to the Office of the Dean of Students. The Dean will assign a Student Judicial Affairs Coordinator who will investigate the charge and alert the student as to its disposition. Consequences of academic dishonesty may be as severe as dismissal from the University. See the Office of the Dean of Students’ homepage (Office of Student Life) at <http://studentaffairs.utep.edu/dos> for more information.

You can also refer to the IEEE website for information on our code of ethics:



<http://www.ieee.org/about/corporate/governance/p7-8.html>

AMERICAN DISABILITIES ACT

The UTEP Disabled Student Services Office was established for the purpose of providing appropriate and reasonable accommodations as mandated in Section 504 of the Rehabilitation Act of 1973 (<http://www.dol.gov/oasam/regs/statutes/sec504.htm>) and the Americans with Disabilities Act (<http://www.ada.gov/>). If you have needs regarding learning disabilities, please help by reporting your special needs to the course instructor the first week of classes.

For addition help, contact the Center for Accommodations and Support Services (CASS):

(915) 747-5148
cass@utep.edu
<http://sa.utep.edu/cass/>

DISCRIMINATION

I do not discriminate, nor will I allow discrimination, on the basis of age, gender, color, ethnicity, national origin, religion, disability, sexual orientation, or favorite sports team. Members of the UTEP community are protected from discrimination and harassment by the State and Federal Laws.

IMPORTANT DATES

16 Jan	First day of class
12-16 Mar	Spring Break – No classes.
29 Mar	Course drop deadline
30 Mar	Cesar Chavez Day Observance / Spring Study Day – No classes.
3 May	Last day of class
4 May	Dead Day
7-11 May	Final Exams

