California State University, Chico
Department of Mechanical and Mechatronic Engineering
and Advanced Manufacturing
MECH 208 Introduction to Technical Computing
Instructor: Dr. Ramesh Varahamurti

Catalog Course Description:

A foundation course in technical computing for engineering. Introduces commercial software commonly used in the solution of engineering problems. Application areas include kinematics and kinetics, fluid flow, thermal systems, and machine design. 1 hour lecture, 3 hours laboratory.

Office: Online
Zoom Office Hours: You may need to launch the link after logging into Chico State to be authenticated.
https://csuchico.zoom.us/j/95840703238?pwd=UGpVL2tZcnVidXhYcTdGT0RjK2h4Zz09

Prerequisite: MATH 121. Recommended: PHYS 204A

Other equipment requirements
To ALL Sections: Have your own laptop computer to run MATLAB for studying and for doing homework.

Software: You may either buy MATLAB and Simulink Student Suite at https://www.mathworks.com/store/link/products/student/new?s_tid=ac_buy_sv_c
ta or download it from this site. Matlab at this site is licensed to CSUChico and you don’t pay.
http://www.mathworks.com/academia/tah-portal/california-state-university-chico-
31511335

Everyone must have Excel on your computer. Download Anaconda with its suite of open source softwares to learn Python. Anaconda is free.

Course Objectives: To Learn to:

1. Solve technical computing problems using MATLAB
2. Write MATLAB functions and scripts, using common mathematical operators and functions
3. Generate various types of plots to graphically represent numerical data
4. Understand and apply programming concepts, such as array, branching, and looping
5. Understand and apply basic concepts of numerical analysis, such as systems of linear equations and numerical integration and differentiation.
Coverage includes the following topics:

Matlab
1. Course overview, Intro to Matlab Desktop, Help/Documentation, Variables, Basic arithmetic operators
2. Vectors, matrices, Indexing, Built-in functions, Matlab Editor, Publishing
3. Elementary math and logical operations, Basic linear algebra, Matrix operation, Element-wise operations, Basic plotting
4. Script and Function, Function handle, Recursion, more plotting
5. Branching, Looping
6. Program design, Pseudo code, Flow chart
7. Data import/export, Basic File I/O operations, Curve fitting, Exporting figures
8. Interpolation, Linear equations solving
9. Numerical Integration
10. Differentiation

Excel
1. Spreadsheet (Excel) basics
2. VBA basics
3. Array formula, Plots, Trend lines
4. Excel Goal seek, Solver, Table look-up (an exercise for you)

Python (time permitting)
Most topics covered in Matlab and Excel.

Final exam

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(Note: Grading policy is subject to change with fair notice.)

Your course grade is determined by Your Total Score = YTS as shown below


The numbers are percentages. Maximum total score is 100%

Expectations:

1. You are expected to learn code-writing by writing programs. Mistakes will be made during the process. And as in learning any language, do not be afraid to make mistakes and learn from fixing them. The key to code writing is prior planning and testing it.
2. Practice helps improve the quality of your program. Quality is a function of
a well thought out and logical flow of code. It is also a function of how easy it is to understand the code by anyone who understands code writing (including yourself after 5 years!)

3. Taking initiative in writing code for problems beyond what’s expected in class will help you in the long run in other areas of your interest.

4. Late work will not be accepted.

5. Home work will be graded and returned to you in time to study for the exams.

6. For Fall 2020 in-Person COVID-19 Face Mask Requirement

In compliance with the California Department of Public Health state mandate, Chico State requires that all students, staff, and faculty, wear a face covering in all indoor spaces on campus, including classrooms, labs, studios, and offices, and outside when physical distancing is not possible. Accordingly, all students are required to wear a face mask covering the nose and mouth in order to participate in the course. Failure to comply with this requirement will result in a referral to Student Conduct, Rights, and Responsibilities and disciplinary action being taken against you by the University.

Individuals unable to wear a face covering due to medical condition should contact the Accessibility Resource Center by phone at (530)-898-5959 or by email at arcdept@csuchico.edu.

For more information about the state mandate, please visit the Chico State COVID -19 News & Information page.

7. Once exams are graded their solutions will be discussed.

8. You may bring any grading errors to the instructor and your grade will be rectified.

**Homework:** Homework must be uploaded before the beginning of class. Work is considered late once class has started and will, therefore, not be accepted. **Quizzes:** Unannounced quizzes will be assigned sometimes and will be graded as homework. Quizzes will be timed and each quiz may carry a higher score as compared to homework.

**Activities:** These are for learning to write code in Matlab and Excel. And python time permitting.

**Exams:** Exam dates will be announced in class along with your responsibility.

**Dropping and Adding:** You are responsible for knowing the deadlines and penalties for adding and dropping classes.
Academic Integrity

Students are expected to be familiar with the University’s Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found on the Student Judicial Affairs web site.

Americans with Disabilities Act: If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations. Accessibility Resource Center 530-898-5959 located in Student Services Center 170, arcdept@csuchico.edu.