MECH 208: Intro to Technical Computing

Instructor: Daisuke Aoyagi
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Office hours: T-F 4-5pm

Class days and times
Section 01/02: T/R 1-1:50pm, F 2-3:50pm @OCNL 438
Section 03/04: T/R 8:00-9:50am @GLNN 223

Prerequisites: MATH 121; (PHYS 204A recommended)

Course Usage of Blackboard Learn
Course syllabus and other material will be posted on Blackboard Learn. You are responsible for regularly checking the online resources, which is accessed through the Chico State Portal. Many assignments, if not all, will need to be turned in through Blackboard Learn.

Course Description and Goals
“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.”

The goal is to prepare students for upper-level courses, such as numerical methods, finite element analysis, measurements and instrumentation, control systems, and machine design.

Student Learning Objectives
Upon successful completion of this course, students will be able to:
1. Solve technical computing problems using MATLAB and Excel
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

Textbook
Other equipment requirements
Section 01/02 (@OCNL 438): A computer to run MATLAB for studying and homework.
Section 03/04 (@GLNN 223): A laptop computer for classroom use; GLNN 223 is not a PC Lab.

Software
MATLAB (bare system $49, Student Suite $99); visit www.mathwork.com
Microsoft Excel 2007 or newer

Course Topics / Tentative Schedule
(Note: subject to change with fair notice.)

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture and Lab Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>Course overview, Intro to Matlab Desktop, Help/Documentation, Variables, Basic arithmetic operators</td>
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<tr>
<td>2</td>
<td>Vectors, matrices, Indexing, Built-in functions, Matlab Editor, Publishing</td>
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<td>3</td>
<td>Elementary math and logical operations, Basic linear algebra, Matrix operation, Element-wise operations, Basic plotting</td>
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<tr>
<td>4</td>
<td>Script and Function, Subfunction, Function handle, Recursion, more plotting</td>
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<td>5</td>
<td>Branching, Looping</td>
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<tr>
<td>6</td>
<td>Program design, Pseudo code, Flow chart</td>
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<td>7</td>
<td><strong>Midterm</strong>, Sound output, Image files</td>
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<td>8</td>
<td>Data import/export, Basic File I/O operations, Curve fitting, Exporting figures</td>
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<td>9</td>
<td>Interpolation, Linear equations solving</td>
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<td>10</td>
<td>Numerical Integration</td>
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<tr>
<td>11</td>
<td>Numerical Differentiation</td>
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<tr>
<td>12</td>
<td>Spreadsheet (Excel) basics</td>
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<td>13</td>
<td>Array formula, Plots, Trend lines</td>
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<tr>
<td>14</td>
<td>(Thanksgiving break)</td>
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<tr>
<td>15</td>
<td>Excel Goal seek, Solver, Table look-up</td>
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<tr>
<td>16</td>
<td>Excel VBA Introduction (if time permits)</td>
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<tr>
<td>17</td>
<td><strong>Final</strong></td>
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Grading
HW: 25%, Midterm: 25%, Final: 25%, Lab Activities and Participation: 25% (incl. short quizzes)
(Note: subject to change with fair notice.)
Dropping and Adding
You are responsible for understanding the policies and procedures about add/drops, academic renewal, etc., found in the CSU Chico University Catalog. You should be aware of the new deadlines and penalties for adding and dropping classes.

Classroom Protocol
During class, please do not engage in any activities that are not related to the class, e.g. personal web surfing, online shopping, e-mail, Facebook, etc.

University Policies and Campus Resources

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, Student Services Center 170, arcdept@csuchico.edu

Student Services
Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found on the current students page of the CSU Chico web site.

Student Learning Center
The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The University Writing Center has been combined with the Student Learning Center. You can also visit the Student Learning Center web site.