

**NANO 15R/CENG 15R: Engineering Computations using MATLAB**  
**FALL 2022 (RCLAS: Remote Class)**

**Lectures:** MWF 10:00 am – 10:50 am (via Zoom: <https://ucsd.zoom.us/j/97898545411>)

**Lab Hours** (optional, EBU II, Room 205)

MF 4:00 p.m. – 6:00 p.m. (also via Zoom: <https://ucsd.zoom.us/j/98739573092>)

TuTh 6:00 p.m.– 8:00 p.m. (also via Zoom: <https://ucsd.zoom.us/j/97773252821>)

Lectures and Discussion sessions will be video recorded and made available for viewing asynchronously on the course website at [Canvas.ucsd.edu](https://Canvas.ucsd.edu).

SYLLABUS

**Instructor:** Dr. Vlado Lubarda  
**Zoom Hours:** MW 11:00 a.m. – 11:50 a.m. (via Zoom: <https://ucsd.zoom.us/j/91319642684>)  
**Email:** [vlubarda@ucsd.edu](mailto:vlubarda@ucsd.edu)

**TA:** Aidan Carrigg  
**Email:** [acarrigg@ucsd.edu](mailto:acarrigg@ucsd.edu)

**TA:** Benjamin Lam  
**Email:** [b6lam@ucsd.edu](mailto:b6lam@ucsd.edu)

**Course website:** Course content and announcements posted weekly on <https://canvas.ucsd.edu/>

**Licensed MATLAB software** can be downloaded and installed on your personal computers: by following the step by step instructions found here: <https://matlab.ucsd.edu/student.html>

**Textbook:** Stormy Attaway, *Matlab – A Practical Introduction to Programming and Problem Solving*, 5th edition, BH, 2019 (available online through <https://roger.ucsd.edu>; instructions for access from off-campus: [VPN Connect](#))

<b>Grading:</b>	Homework	30 %	(assigned weekly via <a href="#">MATLAB Grader</a> )
	Two Midterms	40 %	(most likely end of 4 <sup>th</sup> and 8 <sup>th</sup> week)
	Final Exam	30 %	(Friday, 12/09, 8:00 am – 11:00 am)

**Late policy on homework:**

Homework assignments electronically submitted within 10 hours following the announced deadline will incur a 30% deduction. Assignments submitted more than 10 hours past the deadline will receive no credit.

**Academic integrity:**

Collaboration during homework is permitted, even encouraged, but with full participation of all students in the study group. No collaboration is permitted on the midterms and the final exam. Any observed or detected collaboration on these exams will be reported to the university authorities, which may result in severe consequences on your student status.

All students are expected to sign the Excel with Integrity Pledge to affirm their commitment to academic integrity, respectfulness, and fairness: <https://academicintegrity.ucsd.edu/forms/form-pledge.html>

**Mask policy for in-person classes:**

Each student is expected to contribute responsibly to keeping the UC San Diego community safe and healthy by following campus safety guidelines and staying attuned to the latest campus health and safety updates. Current campus policy requires students wear a mask while indoors. If a student has an OSD pre-approved accommodation for not wearing a mask, the student needs to inform the instructor of the accommodation prior to attending class; the instructor does not need to know the reason behind the accommodation, only that an accommodation has been pre-approved. If a student is unmasked in class and has not informed the instructor of their pre-approved accommodation, the student will be asked to put on a mask, show proof of accommodation, or leave the classroom. If a student does not comply with policy and refuses to leave, the instructor will dismiss the class and refer the student to the Office of Student Conduct.

**Course description** (from course catalog):

Computer programming in MATLAB with elementary numerical analysis of engineering problems. Arithmetic and logical operations, arrays, graphical presentation of computations, symbolic mathematics, solutions of equations, and introduction to data structures.

**Topics to be covered:**

1. Introduction to Matlab software
2. Scalars, vectors, matrices
3. Matlab scripts (M-files)
4. Input and output, data files
5. Selection and loop statements
6. Vectorized codes
7. User-defined functions
8. Advanced plotting techniques
9. Introduction to numerical analysis
10. Programming ethics

**Course objectives:**

Students will learn key computer programming concepts and principles. They will develop programming skills (array manipulation, data analysis and visualization, algorithm design and implementation, numerical analysis, simulation) which they can apply in other coursework and projects at the university and in their future engineering careers. Students' acquired competence in MATLAB programming will directly be transferable to coding in different computer programming languages, such as C++, Python, Java, and FORTRAN. During computer lab sessions students will collaborate with each other and interact with the TAs, exchange learning experiences, and become aware of alternate coding styles and routes to solution, which will enhance their problem-solving tactics and make them more proficient programmers.

**Learning outcomes:**

Proficiency working within the MATLAB environment, familiarity with core MATLAB functionalities, ability to use MATLAB tools and programming language to devise and implement advanced codes to perform engineering analysis, produce problem solutions, and aid engineering design and optimization processes through data processing, numerical analysis, visualization, and simulation.

Understanding of universal computer programming concepts and ideas. Ability to, based on that understanding, readily transition to interpreting and developing codes in other computer programming languages, such as C++, Python, Java, and FORTRAN.

### **Course expectations:**

Come to lecture regularly and on time, contribute to the academic and learning environment in class by posing/answering questions and engaging in discussion, be respectful to fellow classmates and open to collaboration, maintain integrity and high ethical standards, keep up with the course readings, make use of the TA-held computer lab sessions and instructor's office hours, submit homework on time, check email and course website on a daily basis for course announcements and newly uploaded course material. Carefully review posted homework and exam solutions and feedback received on your graded work in order to recognize mistakes and benefit your learning. Bring to the instructor's attention, and discuss with him as early as possible, any difficulties or issues which may arise that could affect your success in the class, so that measures are taken to address the problems promptly.

### **Accommodations for students with disabilities:**

Reasonable accommodations will be provided to students with disabilities. To request accommodations, please contact the Office for Students with Disabilities in order to obtain an Authorization for Accommodation (AFA) letter specifically for your MAE 8 course. The AFA letter needs to be presented by the student to both the instructor and to the OSD Liaison in the department ahead of time so that appropriate accommodations may be arranged.

Contact the OSD for further information: <https://disabilities.ucsd.edu/>.  
osd@ucsd.edu | 858. 534.4382

### **Helpful online resources from MathWorks:**

[MATLAB Help & Documentation](#)  
[MATLAB Onramp](#)  
[MATLAB Central](#)  
[MathWorks Cody](#)

### **Campus Resources for Support and Learning:**

#### *Learning Resources*

[Preparing to Learn Remotely](#)  
[Writing Hub](#)  
[Supplemental Instruction](#)  
[Tutoring](#)  
[Mental Health Services](#)

#### *Library*

For questions about eReserves and research tools:

<https://library.ucsd.edu/ask-us/triton-ed.html>

For help connecting to electronic library resources such as eReserves and e-journals:

<https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/>

*Community Centers*

Learn about the different ways UC San Diego explores, supports and celebrates the many cultures that make up our diverse community. <https://students.ucsd.edu/student-life/diversity/index.html>

*Office of Equity, Diversity, and Inclusion*

858.822.3542 | [diversity@ucsd.edu](mailto:diversity@ucsd.edu) | <https://diversity.ucsd.edu/>  
<https://students.ucsd.edu/student-life/diversity/index.html>  
<https://regents.universityofcalifornia.edu/governance/policies/4400.html>

*Counseling and Psychological Services (CAPS)*

Supporting student mental health, well-being, academic success, and personal development:  
<https://wellness.ucsd.edu/CAPS/Pages/default.aspx> | (858) 534-3755

*Basic Needs*

Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in this course, is encouraged to contact:  
[foodpantry@ucsd.edu](mailto:foodpantry@ucsd.edu) | [basicneeds@ucsd.edu](mailto:basicneeds@ucsd.edu) | (858)246-2632

*Technical Support*

For help with accounts, network, and technical issues: <https://acms.ucsd.edu/contact/inde>