# Introduction to MATLAB
## ITP 168 (2 Units)

**USC Viterbi**
School of Engineering

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| **Catalogue Description** | Fundamentals of MATLAB: a high-performance numeric computation and visualization environment. Overview of linear algebra and matrix manipulation; using 2-D and 3-D plotting routines; programming in MATLAB; basic numerical analysis |
| **Objective** | Overview of MATLAB features, problem-solving methodology. arrays; use of files, functions and data structures; programming; plotting; solution of linear algebraic equations; statistics and probability; numerical methods for calculus and differential equations; and basics of symbolic methods, 2D and 3D visualization of scientific data |
| **Prerequisites** | Recommended Preparation: Math 118x or Math 125 |
| **Instructor** | Listed under Contacts on Blackboard |
| **Hours** | 2 hours and 40 minutes per week |
| **Course Structure** | The class meets for one hour and 20 minutes twice a week for a total of 2 hours and 40 minutes per week. These sessions include lectures and hands-on learning labs which are part of the overall grade. There will be weekly assignments, a midterm, and final exam. Access to a personal computer with MATLAB software installed is required. Students may download MATLAB through the USC ITS website: https://software.usc.edu/index.aspx |
| **Textbook(s)** | Required: zyBooks at http://zybooks.zyante.com<br>Optional: "Mastering MATLAB" Duane Hanselman, Bruce Littlefield. Pearson Education. ISBN: 9780136013303 |
| **Grading** | The course is graded with the following weights: |

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| Participation | 5% |
| Homework | 25% |
| Labs | 15% |
| Midterm | 25% |
| Final Exam | 30% |
| Total | 100% |

| **Grading Scale** | Letter grades will be assigned according to the following scale: |
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| 93%+ | A |
| 90-92% | A- |
| 87-89% | B+ |
| 83-86% | B |
| 80-82% | B- |
| 77-79% | C+ |
| 73-76% | C |
| 70-72% | C- |
| 69 | D+ |
| 67-68 | D |
| 66 | D- |
| 65 and below | F |

If you are taking the class with a P/NP grade option, you must earn a grade of 70% or higher in order to receive a P.

| **Homework** | The assignments will be posted on Blackboard under the "Assignments" section. Each assignment will include instructions, due date, and a link for submission. All assignments must be submitted through Blackboard. Homework assignments that are emailed to instructors or lab assistants will be ignored completely. |
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Late assignments may be accepted up until 72 hours after the due date/time. After the due date/time up until 24 hours after the due date/time the student will be penalized 10% of the full assignment points. After 24 hours after the due date/time and up until 48 hours after the due date/time, the student will be penalized 20% of the full assignment points. After 48 hours after the due date/time and up until 72 hours after the due date/time, the student will be penalized 40% of the full assignment points. After 72 hours after the due date/time, the student will receive no credit for the assignment

It is the responsibility of the student to ensure that all work is submitted properly. All homework assignments will be submitted through Blackboard. In issues of incorrect submission, the student will receive a 0 for the assignment and will not be allowed to resubmit the assignment for a grade once the grade has been entered. This policy will be enforced at all times.

If a student resubmits an assignment before the grading of that assignment has been done, the student will be graded based on their last submission. If the submission is late, it will be penalized for being submitted late.

Extensions for homework will only be granted for those students who have a medical/family emergency or illness resulting in an inability to complete the assignment on time. Students must provide official documentation.

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| **Labs** | Labs are assigned during class and must be completed before the end of the class period. Students will apply the lecture material presented in class to complete the lab. Knowledge of previous material will also be required, but not the focus of the lab. |
| | A late submission for a lab will be given a score of 0. No student is allowed to anticipate labs, or to begin work on labs before the class has started. Once a lab is graded, a student may not submit another lab for credit. There are no makeup labs. The only exception is a medical/family emergency, provided the student notify the instructor and provide official documentation for the emergency. |
| | Makeup labs must be performed under the supervision of the instructor or member of the teaching staff only. Makeup labs must be completed no later than one week from the date the lab was assigned, or in the case of a medical emergency or illness, one week from the student's return date to school. |
| | All labs will be posted to the course's Blackboard page under "Assignments". Students will be given the lab guidelines and any supporting documents or files necessary to complete the lab. Student must use this lab assignment link to submit their labs. Labs submitted via email or any other format will not be graded and the student will receive a 0 for that lab assignment. |
| | Labs are graded on a 1 point scale. If the script or function file is able to run as detailed in the lab guidelines and conforms to all best practices detailed in the course, then the student will receive full credit. If the script or function file is able to run as detailed in the lab guidelines and does not conform to all best practices detailed in the course, then the student will receive 0.5 points. If the script or function file does not run as detailed in the lab guidelines, the student receives no credit. |
| **Participation** | Students will be required to read through the online reading assignments and participate in the online activities associated with each week's reading provided through the online text book. |
| | Activity is monitored by the instructor and will be tracked each week. |
| **Policies** | *Make-up policy for exams:* To make up for a missed exam, the student must provide a satisfactory reason (as determined by the instructor) along with proper documentation. Make-up exams are generally only offered in emergency situations. |
| | Before logging off an ITP computer, students must ensure that they have saved any work to either a USB drive or a service such as Dropbox. Any work saved to the computer will be erased after restarting the computer. ITP is not responsible for any work lost. |
| | ITP offers Open Lab use for all students enrolled in ITP classes. These open labs are held beginning the second week of classes through the last week of classes. Hours are listed at: http://itp.usc.edu/labs/. |

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| **Academic Conduct** | Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct/. |
| | In this class, all homework submissions will be compared with current, previous, and future students' submissions using MOSS, which is a code plagiarism identification program. If your code significantly matches another student's submission, you will be reported to SJACS with the recommended penalty of an F in the course. |
| | It is okay to discuss solutions to specific problems with other students, but it is not okay to look through another student's code. It does not matter if this code is online or from a student you know, it is cheating. Do not share your code with anyone else in this or a future section of the course, as allowing someone else to copy your code carries the same penalty as you copying the code yourself. |
| **Support Systems** | A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. |
| | If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information http://emergency.usc.edu/* will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology. |
| | Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* http://equity.usc.edu/ or to the *Department of Public Safety* http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc.usc.edu describes reporting options and other resources. |
| **Disability Services** | Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your course instructor (or TA) as early in the semester as possible. DSP is located in STU 301 and is open from 8:30am to |

5:00pm, Monday through Friday. Website and contact information for DSP http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) ability@usc.edu

| **Incomplete and Missing Grades** | Excerpts for this section have been taken from the University Grading Handbook, located at http://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html. Please see the link for more details on this and any other grading concerns.<br><br>A grade of Missing Grade (MG) "should only be assigned in unique or unusual situations… for those cases in which a student does not complete work for the course before the semester ends.  All missing grades must be resolved by the instructor through the Correction of Grade Process.  One calendar year is allowed to resolve a MG.  If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.<br><br>A grade of Incomplete (IN) "is assigned when work is no completed because of documented illness or other 'emergency' occurring after the twelfth week of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks)." |
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# Course Outline

| W | Topic(s) | Lab | Homework | ZyBooks Reading |
|---|----------|-----|----------|-----------------|
| 1 | Intro | None | None | Week 1 |
| | Variables | None | | |
| 2 | MATLAB Basics/Algorithms | LP1 | Homework 1 Assigned | Week 2 |
| | Array Basics | LP2 | | |
| 3 | *LABOR DAY* | None | Homework 2 Assigned | Week 3 |
| | Array Functions | LP3 | Homework 1 Due | |
| 4 | Conditionals | LP4 | Homework 3 Assigned | Week 4 |
| | Conditionals | LP5 | Homework 2 Due | |
| 5 | Loops | LP6 | Homework 4 Assigned | Week 5 |
| | Loops | LP7 | Homework 3 Due | |
| 6 | Cell Arrays | LP8 | Homework 5 Assigned | Week 6 |
| | Structures | LP9 | Homework 4 Due | |
| 7 | File I/O | LP10 | Homework 6 Assigned | Week 7 |
| | Functions | LP11 | Homework 5 Due | |
| 8 | *MIDTERM* | None | None | None |
| | Midterm Review | LP12 | | |
| 9 | Functions | LP13 | Homework 7 Assigned | Week 9 |
| | Functions | LP14 | Homework 6 Due | |
| 10 | Data Visualization | LP15 | Homework 8 Assigned | Week 10 |
| | Data Visualization | LP16 | Homework 7 Due | |
| 11 | Data Analysis | LP17 | Homework 9 Assigned | Week 11 |
| | Data Analysis | LP18 | Homework 8 Due | |
| 12 | Differentiation | LP19 | Homework 10 Assigned | Week 12 |
| | Integration | LP20 | Homework 9 Due | |
| 13 | Linear Algebra | LP21 | Homework 11 Assigned | Week 13 |
| | Linear Algebra | LP22 | Homework 10 Due | |
| 14 | Strings | LP23 | None | Week 14 |
| | *THANKSGIVING* | None | | |
| 15 | Strings/Advanced Topics | LP24 | Homework 11 Due | Week 15 |
| | Final Exam Review | LP25 | | |
| | *FINAL EXAM – according to the final exam schedule* | | | |