An introductory course in computer science and programming (using MATLAB) and its use in solving engineering and scientific problems. The emphasis is on the logical analysis of a problem and the formulation of a computer program leading to its solution. Topics include basic concepts of computer systems, algorithm design, programming languages and data abstraction. Designed for students not specializing in computer science.

1.1 Contact Information

**INSTRUCTOR:** Alex Gerbessiotis  
**E-MAIL:** alexg+cs101@njit.edu  
**OFFICE:** GITC 4213, 4th floor  
**TEL:** (973)-596-3244  
**OFFICE HOURS:** Tue 4:00-5:30pm and Thu 4:00-5:30pm. Else, by appointment Mon/Tue/Thu  
**ASSISTANT:** TBA on course web-page  
**CLASS HOURS:** 18:00-21:05 GITC 2400  
**WEB PAGE:** http://www.cs.njit.edu/~alexg/courses/cs101/index.html  
If it breaks down, use alternatively one of the following,  
**WEB PAGE:** http://web.njit.edu/~alexg/courses/cs101/index.html  
**WEB PAGE:** http://cs.njit.edu/~alexg/courses/cs101/index.html  

Print Handout 1 from Web-page and compare the printout to this document! They must be identical.

1.2 Course Administration

**Prerequisites**  
No course required. Knowledge of last 4 digits of NJIT ID, and NJIT UCID and password.

**Textbook**  
*Note that a newer version might be out by the start of the semester.*

**CourseWork:**  
2 exams (including the final); 3 MiniProjects; At most 4 unannounced Quizzes.

**Grading:**  
1000 points = Exam1(345) + Exam2(345) + QuizzesAndMP(310).

**Exams/Quizzes**  
The two exams (Exam1, Exam2) are open-textbook; you may bring a HARD-copy of the textbook but you are not allowed to borrow one during the exam. 15-minute quizzes are closed everything and worth 50 points.  
Exam1 (midterm) is 90 mins, 345 points and Exam2 (final) is 120 mins, 345 points.

**MP1-3**  
Three MiniProjects; 70 points each. DUE before noon of a FRIDAY which is NOT a class day.  
*Note*  
At most 310 points of Quizzes and MPs account toward the total grade. There is room to miss one (or the other).

**Due Dates**  
MiniProjects MUST BE RECEIVED BY EMAIL PER INSTRUCTIONS before NOON of the day they are due. For late submissions 30 pts deducted from grade at noon time that day, and noon the following day(s), if applicable.

Tentative list of topics

**Topics**

T1 : High-level computer organization. Introduction to computing. Bits and Bytes.  
T2 : Data representation in memory. Integers and reals  
T4 : The fundamental concepts of MATLAB. MATLAB basics  
T5 : MATLAB vector/matrix functions and operations  
T6 : MATLAB misc plotting functions  
T7 : MATLAB Branching statements  
T8 : MATLAB loops (iterative) statements. MATLAB functions  
T9 : Program design. MATLAB profiling. Recursion.  
T10 : Advanced MATLAB features. Sorting and Searching.
2.1 Course Objectives and Outcomes

Objective 1  Learn the fundamentals of computers, computing and programming, MATLAB and its programming environment.

Objective 2  Learn how to use and allocate MATLAB data-types, their operations, behavior and side-effects.

Objective 3  Learn how to trace a MATLAB program and understand its interactions with MATLAB M-files and MATLAB functions of various types and how to modify it.

Objective 4  Learn how to use MATLAB to solve (simple) computational problems.

Objective 5  Learn how to use MATLAB to solve more elaborate computational problems.

Outcome 1  Be able to explain fundamental computing concepts related to processing, memory and data organization as related to engineering.

Outcome 2  Become familiar with the syntax, functionality and capabilities of MATLAB.

Outcome 3  Be able to understand and use MATLAB primitive data types, and effectively use built-in MATLAB functions and trace MATLAB programs.

Outcome 4  Become familiar with matrices and arrays in MATLAB and learn how to formulate and use array operations.

Outcome 5  Be able to provide a computer-based programming solution for simple engineering problems using a high-level language such as MATLAB and how to modify one as needed.

Outcome 6  Be able to effectively and efficiently use MATLAB for solving more involved computational problems.

2.2 Tentative Course Calendar

<table>
<thead>
<tr>
<th>Week*</th>
<th>Tue to Mon</th>
<th>Exams</th>
<th>MP</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>W01</td>
<td>09/01-09/07</td>
<td></td>
<td></td>
<td>Week and Semester starts on Tue (Sep 1);</td>
</tr>
<tr>
<td>W02</td>
<td>09/08-09/14</td>
<td></td>
<td>MP1 out</td>
<td>Note that Tue Sep 8 is a ”Monday”</td>
</tr>
<tr>
<td>W03</td>
<td>09/15-09/21</td>
<td></td>
<td></td>
<td>Before noon FRI OCT 02</td>
</tr>
<tr>
<td>W04</td>
<td>09/22-09/28</td>
<td></td>
<td>MP2 out</td>
<td>Before noon FRI OCT 16</td>
</tr>
<tr>
<td>W05</td>
<td>09/29-10/05</td>
<td></td>
<td>MP1 due by</td>
<td>Midterm is Ex1</td>
</tr>
<tr>
<td>W06</td>
<td>10/06-10/12</td>
<td></td>
<td>MP2 due by</td>
<td>Mon Nov 2 : Withdrawal deadline</td>
</tr>
<tr>
<td>W07</td>
<td>10/13-10/19</td>
<td></td>
<td></td>
<td>No classes Thursday: Thanksgiving Day (11/26)</td>
</tr>
<tr>
<td>W08</td>
<td>10/20-10/26</td>
<td></td>
<td>MP3 out</td>
<td>Before noon FRI DEC 4</td>
</tr>
<tr>
<td>W09</td>
<td>10/27-11/02</td>
<td></td>
<td>MP3 due by</td>
<td>Last day of classes is Thu Dec 10</td>
</tr>
<tr>
<td>W10</td>
<td>11/03-11/09</td>
<td></td>
<td></td>
<td>EX1***</td>
</tr>
<tr>
<td>W11</td>
<td>11/10-11/16</td>
<td></td>
<td></td>
<td>Tue Dec 15-Mon Dec 21 is Final Exam Week</td>
</tr>
<tr>
<td>W12</td>
<td>11/17-11/23</td>
<td></td>
<td></td>
<td>***The final exam is prescheduled: same place, day and time as the class during exam week.</td>
</tr>
<tr>
<td>W13</td>
<td>11/24-11/30</td>
<td></td>
<td></td>
<td>** Leftovers from Thanksgiving Recess and Labor Day.</td>
</tr>
<tr>
<td>W14</td>
<td>12/01-12/07</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>W15</td>
<td>12/08-12/10**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIN</td>
<td>12/15-12/21</td>
<td></td>
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</tbody>
</table>

*The Week starts on Tuesday and ends on the following Monday. ** Leftovers from Thanksgiving Recess and Labor Day. ***The final exam is prescheduled: same place, day and time as the class during exam week.

Any modifications or deviations from these dates, will be done in consultation with the attending students and will be posted on the course Web-page. It is imperative that students check the Course Web-page regularly and frequently.
Programs

Submitted code must conform to the requirements of Handout 2 and of the MiniProject(s).

Grading

If you use a pencil in an exam or quiz do not complain about grading afterwards.

Grades

Check the marks in a written work and report errors promptly. Make sure you report such problems to the grader and the instructor within two weeks from receipt, return, letter-grade posting and no later than the (first) Reading Day; for the final exam, within one week (7 calendar days) from the exam date. Talk to the grader first and then to the instructor (if different). Letter grades are decided based on a 0 to 1000 point performance. A 50% or more is C or better, 90% or more is USUALLY required for an A, but it may vary slightly depending on overall class performance.

Absenteeism

The instructor reserves the right to push a student’s grade down one level if he notices a student being absent from MORE than 2 classes; one way to note absenteeism is absence from a quiz or not picking a graded quiz, or by handing out a sign-up list.

Collaboration

Collaboration of any kind is NOT allowed in exams or mini-projects. A student must turn in code (mini-project) that has been fully written by him/her. Any submitted code (even few lines) obtained through the Internet or otherwise, or is product of another person’s/student’s work, or is common with another submission in the same section/course or other, risks severe punishment, as outlined by the University; all parties of such witting or unwitting interaction receive automatically 0 in ALL miniprojects, not just the miniproject in question, and one lower letter grade level. The work you submit must be the result of your own effort and you must safeguard it.

Mobile Phones

Switch off (not just silence) mobile devices before class.

Email/SPAM

Always use an NJIT email address; NJIT spam filters might be unpredictable. Include cs101 in the subject line. Do not complain otherwise.

Missing class

If you miss a class and there is no Exam/Quiz it’s up to you to make up for absence.

MakeUp

There are three scheduled mini projects. Plan ahead of time and submit early; do not wait until the last day. NO EXTENSIONS are granted for any reason medical, judicial, or otherwise for the mini-projects. If you miss an exam and there is a valid documentation for your absence, such documentation must be presented to the Dean of Student Services (DOSS) within 3 working days from the day the reason for the absence is lifted and also inform us on this. The maximum accommodation will be the number of (justified) missing days to the exam date. For the quizzes no MakeUp will be given. A grade based on the Final will be extrapolated for approved cases (by the DOSS).

Final Exam

The final exam is scheduled by the Registrar; If you make travel arrangements, or make private arrangements with other instructors to have other exams rescheduled you will not be accommodated.

The NJIT Honor Code will be upheld; any violations will be brought to the immediate attention of the Dean of Student Services. Read this handout carefully!