CS 122L: Programming for Engineering and Science
(Lab for CS 122)

Fall 2017 Course Syllabus

Northern Arizona University • College of Engineering, Forestry, and Natural Sciences
School of Informatics, Computing, and Cyber Systems

Course Information
Catalog Description: Introduces computer programming for engineers, scientists, and math
majors. Emphasizes problem solving, algorithms, and structured
programming.

Broad Topics: Algorithms, MATLAB, Introduction to computer systems
(Note this course does not cover C++ or C programming. That will be
covered in EE222, Intermediate Programming.)

Prerequisites: MAT 108 or better
Co-requisites: None
Skill Level: Introductory
Credit Hours: Lab: 1

<table>
<thead>
<tr>
<th>Course-Section</th>
<th>Type</th>
<th>Day</th>
<th>Building</th>
<th>Room</th>
<th>Time</th>
<th>Class Aides/TA</th>
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<tbody>
<tr>
<td>CS122L-1</td>
<td>Lab</td>
<td>M</td>
<td>Engineering</td>
<td>106</td>
<td>5:30 PM – 8:00 PM</td>
<td>Han Peng, Kelli Ruddy</td>
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<td>CS122L-2</td>
<td>Lab</td>
<td>Tu</td>
<td>Engineering</td>
<td>106</td>
<td>8:50 AM – 10:50 AM</td>
<td>Caitlin Barrett, Christopher Barrett</td>
</tr>
<tr>
<td>CS122L-3</td>
<td>Lab</td>
<td>Tu</td>
<td>Engineering</td>
<td>106</td>
<td>5:30 PM – 7:30 PM</td>
<td>Caitlin Barrett, Tatum Begay</td>
</tr>
<tr>
<td>CS122L-4</td>
<td>Lab</td>
<td>W</td>
<td>Engineering</td>
<td>106</td>
<td>5:30 PM – 7:30 PM</td>
<td>Jose Capestany, Han Peng</td>
</tr>
<tr>
<td>CS122L-5</td>
<td>Lab</td>
<td>Th</td>
<td>Engineering</td>
<td>106</td>
<td>8:50 AM – 10:50 AM</td>
<td>Caitlin Barrett, Tyler Mitchell</td>
</tr>
<tr>
<td>CS122L-6</td>
<td>Lab</td>
<td>F</td>
<td>Engineering</td>
<td>106</td>
<td>11:30 AM – 1:30 PM</td>
<td>Josh Holguin, Steven Strickland</td>
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<tr>
<td>CS122L-7</td>
<td>Lab</td>
<td>F</td>
<td>Engineering</td>
<td>106</td>
<td>2:20 PM – 4:20 PM</td>
<td>Ben George, Chandler Hayes, Junzhe Wang</td>
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<tr>
<td>CS122L-8</td>
<td>Lab</td>
<td>F</td>
<td>Engineering</td>
<td>106</td>
<td>5:30 PM – 7:30 PM</td>
<td>Josh Holguin, Junzhe Wang</td>
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Supplemental Instructor (SI) Leader
https://nau.edu/ssi/academic-success-centers/supplemental-instruction/

Here are the times available for you to work with our CS122 SI Leader and TA’s. Don't fall
behind!
Taylor Yee (tey24 [at] nau.edu) is the CS122 lecture SI Leader this semester. CS122 SI session times will be announced by Taylor Yee.

You might also see a “FYLI Peer T.A.” in your class. For the lab classes, that individual is Samantha H. Muellner. Peer TA’s are very knowledgeable, often upper division (junior/senior) students. They are also here to answer questions and to help ensure your success. CS122L T.A. Tyler Mitchell (tjm375@nau.edu) will be holding office hours Tuesday and Thursday from 12:30pm to 2pm. If those hours don’t work with your schedule, contact Tyler for an appointment. He will meet at the CS Projects Room, Engineering Bldg. 69 Rm. 104 (or post a sign there if there is an alternate location) [revised 10-6-17].

Final Exam: No final exam for CS122L (lab)
Required Text: None
Course Websites: http://bblearn.nau.edu
All assignments should be submitted electronically to Blackboard by the due date. All assignments must be the students own individual work, unless otherwise noted. Any group assignment must contain all member names to receive credit.

Instructor Information
Lab Instructor: Prof. Steven Jacobs (Please note that CS122 lecture classes are taught by Dr. Michael Leverington this semester).
Office hours: Please check Prof. Jacobs’ web site and click on "schedule". Other times by appointment.
Office location: Room 324C Engineering Building
Email: Steven [dot] Jacobs [at] nau [dot] edu
Phone: Please email.
NAU Address: Box 15600, Flagstaff, AZ 86011-5600

Assessment and Grading System (CS122L lab)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Points</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Attendance (see “Attendance&quot; section of syllabus below)</td>
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<tr>
<td>Process quiz</td>
<td>1 x 10 pts</td>
<td>3.5</td>
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<tr>
<td>Academic Integrity @ NAU workshop</td>
<td>1 x 10 pts</td>
<td>3.5</td>
</tr>
<tr>
<td>Pre-labs</td>
<td>13 x 5 pts each = 65 pts</td>
<td>22.8</td>
</tr>
<tr>
<td>Labs</td>
<td>13 x 15 pts each (plus one Lab 0 intro of 5 pts) = 200 pts</td>
<td>70.2</td>
</tr>
<tr>
<td>Total</td>
<td>285 pts</td>
<td>100.0</td>
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Your class grade is based on the standard scale of points earned: 90%=A, 80%=B, 70%=C, 60%=D, below 60%=F. Total points may vary due to progress of the lab class. No grades are curved or dropped, though there may be opportunities for extra credit.

Assignments are due on-line on the due date. Regrade requests of assignments will include regrade of the entire assignment.

Review the grading comments in BbLearn for any feedback on your work. If you feel a mistake was made in grading your assignment, please come and visit during office hours. You have 2 weeks to question a grade once it is posted in BbLearn. It is your job to check your grades.

**Late Policy**
Project and homework assignments are accepted late with a 10% penalty per school day.

Any students more than 15 minutes late to lab will be turned away.

If you miss a lab or know you will miss a lab, discuss the matter with your Lab TA as soon as possible.

**Communication with professor:** *PLEASE include your class/section info in email*
Outside of class, please contact the instructor by attending an office hour or via regular email (not BbLearn email) for any questions (e.g., requesting an excused absence, assignment content, or your status in the class). For the CS122L lab students, make sure to include “CS122L-n”, where “n” is the lab section number (1 to 8) in which you are enrolled.

**Labs and Pre-Labs (CS122L)**
CS122L is the lab class for CS122. The lab and lecture classes are separate classes, yielding separate grades (one grade for the 2-unit lecture and one grade for the 1-unit lab). The lab class meets once a week in Engineering Room 106.

CS122L lab classes are conducted as “pair programming” (2-person team concept to be described in lab). In pair programming for CS122L, each student will submit a copy of the lab report into BbLearn. Make sure the lab report document has both names at the top. A point penalty will be assessed for unexcused absences in lab or if the student submits the lab as an individual.

There are weekly *pre-labs that are your ticket in* to start the lab. With the pre-lab, you will learn concepts and be directed to specific videos or reading on relevant subject matter for the lab. If you do not complete the CS122L pre-lab for a given week, you will be admitted to lab, however you cannot start your lab until the pre-lab is completed. There will be a point penalty, but please do come to lab.
“Plan, Analyze, Implement, Test”. This is a development methodology you will become comfortable with in CS122L. It has to do looking at a computer-based problem and formulating a solution BEFORE diving in and solving the problem. You will see this again during the semester. One reference for this process is: http://en.wikipedia.org/wiki/Systems_development_life_cycle

There are lab submission guidelines to make clear what is expected in each lab. These can be found in BbLearn under “Course Content”.

**Attendance & Absentee Point Reductions**
Regular attendance is expected. Attendance is taken. Please do not be late or leave until class is dismissed. While class attendance is expected, please be cautious about attending class if you are feeling ill. Definitely inform your instructor by email if you are feeling unwell; if you are experiencing flu-like symptoms, you should not attend class; please take precautions not to infect others, and seek medical attention if your symptoms worsen. Remember, unless you are ill or have a family emergency, it is unwise to miss any classes. Recall that absences do not include institutionally documented and approved absences. Besides illness, absences are also permitted for medical reasons or family matters, if discussed in advance of the missed class.

If attendance is poor, your instructor will use judgment at the end of the semester to drop one letter grade for poor attendance.

**Plagiarism and Cheating**
Students are to work independently and without consultation with other students unless the assignment specifically states that you may collaborate. Grades are a way to motivate students and to evaluate students' mastery of a subject and their ability to complete work. The grades students get are not themselves truly important, but instead are representative of their knowledge, capabilities, and work ethic, and those are the aspects that matter.

If you plagiarize source code, fabricate results, make fraudulent claims, or attempt to cheat in any way, you are misrepresenting yourself, your level of understanding, your capabilities, and your ability to accomplish things. It is both dishonest and unethical.

Anyone who plagiarizes, copies, fabricates, or cheats will at the least receive a zero on that assignment or test. You may be asked to sign an Academic Dishonesty Statement for this class. It says "confirmed violations will result in a failing grade for the course and will be reported to the Dean of Students according to the policies set forth by Northern Arizona University, and Appendix G of the Student Handbook".

Consulting with others and using their advice on projects is fine. However, the work you submit should be your own work that you thoroughly understand and are entirely responsible for.
Pre-requisites and dropping the course
If you have not completed the prerequisites for a course as stated in the academic catalog or if you are absent from class during the first week, you may be administratively dropped from the course before the 21st day of the term. Do not rely on your instructor to drop you from the courses that you want to drop. You are responsible for changing your own course schedule.

Course Description
Being able to perform billions of calculations on billions of numbers per second, computers are an incredibly useful tool. Although we are obviously unable to enter calculation instructions fast enough to keep up, we can harness the power of computers by writing programs that lay out in advance all the calculations we wish to perform."

While many people are able to use existing software, not many people know how to actually program computers. This is a pity because we’re surrounded by systems that allow us to define custom programs to solve unique problems - Excel spreadsheets, calculators, 3D modeling programs, and NAU web servers just to name a few.

Intended Course Student Learning Outcomes
This class will teach you the fundamentals of analyzing a problem, writing a program to process and analyze relevant data, and interpreting the output.

- Break down computational problems into a series of easily-managed steps.
- Create programs in the MATLAB language.
- Process numerical data and perform input and output operations on it.

Liberal Studies
The mission of the Liberal Studies Program at Northern Arizona University is to prepare students to live responsible, productive, and creative lives as citizens of a dramatically changing world. To accomplish the mission of Liberal Studies, Northern Arizona University provides a program that challenges students to gain a deeper understanding of the natural environment and the world’s peoples, to explore the traditions and legacies that have created the dynamics and tensions that shape the world, to examine their potential contributions to society, and thus to better determine their own places in that world.

CS 122 supports this mission by helping you:
- Gain a deeper understanding of the tools and processes that enable and drive our technologically-oriented society.
- Explore the history and culture of MATLAB and Unix.
- Understand the basics of computer programming and be able to apply them to solve the various computational problems you encounter in life.

CS 122 is a course in the Science Distribution Block and supports the intent of that block by:
- Teaching you the basics of two programming languages and the Unix operating system.
• Teaching you *how to program* and problem-solve with a programming language.
• Cultivating highly logical and algorithmic thinking.
• Exposing you to the common algorithms and techniques that are the basic building blocks of all programming.

Through the program students acquire a broad range of knowledge and develop essential skills for professional success and life beyond graduation. In addition to discipline-specific skills, this course will emphasize quantitative reasoning, an essential skill defined in the University's Liberal Studies Program. By completing all the coursework in the class, you will meet all six learning outcomes specifically linked to quantitative reasoning:

• You will assess descriptions of both raw and derived quantitative data by examining input data relevant to programs you wish to write.
• You will select and apply the appropriate mathematical, statistical, or graphical models by choosing the best organizational and algorithmic techniques for a particular programming problem.
• You will perform data manipulations through coding and then organize data graphically, numerically, or functionally by choosing and implementing an appropriate output format.
• You will interpret the results of models that you program, including margins of error from statistical data.
• You will use graphs to solve problems such as scheduling, organizing information or finding optimal strategies.
• You will describe and explain the processes and results by applying quantitative literacy skills in the project reports you write.

**Student Success**
Student success is a joint responsibility – that I am here to facilitate your success, but you need to come to class and do the work. Below is a list of what is required to be successful in this class.

*Habits of Highly Successful Students*
1. Attend class
2. Listen
3. Read the book
4. Ask questions
5. Get help when you need it
6. Make friends with someone in class
7. Do not miss assignments
8. Manage your time
9. Practice what you have learned
10. Start homework and programming projects early

We are here to facilitate your learning. We show you the way, you learn the material.
There is a **Supplemental Instructor** (SI) Leader for CS122 named Taylor Yee (tey24 [at] nau.edu). The SI will hold review sessions to help you with lecture homework and projects, as well as to help review for tests.

You may also see Lab Class Aides attend some lectures to ensure that lecture and lab content are synchronized. CS122L Lab questions are to be directed to your Lab Class Aides first, but the SI is very knowledgeable in all aspects of MATLAB programming. The SI is here to answer questions and to help ensure your success.

**Computer Access**
The projects and many of the homework assignments are programming problems requiring a computer to solve. Students can use your NAU computer account to access lab computers and our CEFNS computer remotely.

There will not be any lecture time spent in the computer lab. Students are responsible for going to the lab on their own time or working from home to complete the assignments. Students can use the general lab in room 106, the PC lab in room 317, the computers in the building's Internet Cafe or any of the various PC labs around campus. However, only the computers in the engineering labs are guaranteed to have MATLAB installed - other computers may or may not. The computers in the math building should have MATLAB as well.

The Engineering Building’s computer lab hours are posted in the building. After-hours access is also available with keypad access from the outside. Engineering students can get a keycode at the Engineering front desk - unfortunately this option is not available to non-Engineering majors.

CS122 will be covering the MATLAB language. Because even the student version of MATLAB can be pricey, I would recommend not purchasing that software. MATLAB is available on all of our Engineering lab computers; to access MATLAB via Engineering lab computers, enter: Start > All Programs > Math Applications > MATLAB.

MATLAB is available to students anywhere via the remote desktop server. You can find how to connect to that on the CEFNS IT website through a link for a Windows, MAC, or Linux machine at [http://nau.edu/CEFNS/IT/Support/](http://nau.edu/CEFNS/IT/Support/)

Most of your questions on general computer setup can be answered at the following NAU ITS Academic Computing Help Desk: [http://nau.edu/its/services/helpdesk/](http://nau.edu/its/services/helpdesk/) or log in to the ITS portal at: [http://nau.service-now.com/](http://nau.service-now.com/)

**University Policies**
There are a number of university policies that govern your education and safety that all students should be aware of. These are:

- Safe Working and Learning Environment
- Students with Disabilities
• Accommodation of Religious Observance and Practice
• Institutional Review Board (And Use of Human Subjects)
• Academic Dishonesty
• Medical Insurance Coverage for Students
• Classroom Management
• Evacuation Policies

The Safe Environment, Students with Disabilities, Academic Contact Hour, Academic Integrity, Research Integrity, Sensitive Course Materials and Classroom Disruption policies are available at: http://nau.edu/OCLDAA/_Forms/UCC/SyllabusPolicyStmts2-2014/

You will find a complete list of university policies here: http://nau.edu/university-policies/

Also, please review the latest version of the on-line NAU Student Handbook here: http://nau.edu/Student-Life/Student-Handbook/

Resources for Student Success
Successful university students take advantage of services and resources designed to boost learning and achievement. NAU recommends that you begin with:
• Supplemental Instruction - attend these course-specific review sessions whenever offered; proven to reduce D’s and F’s
• Academic Success Centers - free drop-in, online, and individual tutoring appointments for math, writing, and over 100 courses; available Monday through Friday
• ResourceConnect - your online central navigation point for all NAU student resources
• Action Center - messages to keep you academically on track – when you get a message take action!

For a full-listing of student success services visit: http://nau.edu/University-College/For-Students--Resources-and-Support/