

**CSC 412: Tools and Techniques for Computational Analysis**  
**Wednesday 5:45PM-9:00PM**

***Instructor Information***

Instructor: Dr. John McDonald  
Office: CST, Room 831  
Office Hours: Monday, 3:30pm-5:00pm  
Wednesday, 3:30pm-5:00pm  
Phone: (312) 362-5142  
Email: [jmcdonald@cs.depaul.edu](mailto:jmcdonald@cs.depaul.edu)  
Course page: <http://d2l.depaul.edu>

***Course Description***

Use of mathematical software to explore basic concepts in linear algebra and calculus. Scripting for symbolic and computational processing. Emphasis is on applications in computer science, finance, data mining, and computer vision.

***Highly Recommended Books***

- Shores, Thomas S. Applied Linear Algebra and Matrix Analysis, Springer, 2007.
- Ayres, Mendelson, Calculus, 6th Edition, 2013.

***Prerequisites***

None, but we do assume at that you have taken college level algebra and some trigonometry (pre-calculus)

***Grading***

Grading in this course will be based on a combination of homework, programming and participation assignments, periodic quizzes, the midterm exam, which will be held during the 5<sup>th</sup> week of class, and the final exam which will be held on the scheduled final exam date & time for the class. The final grade will be computed based on the following weights:

- Homework/programming assignments and quizzes: 35%,
- Midterm exam on October 10<sup>th</sup>: 30%
- Final project due on November 21<sup>st</sup>: 35%

The midterm and final exams are mandatory and you must take them to pass the course. Makeup exams/quizzes are only given in extreme circumstances (severe illness, etc.) which must be documented. If there is a chance that work or other commitments will cause you to be absent for one of these, you should enroll in the online section, as it gives more flexibility in terms of date and time for the exam.

***Homework/Programming Assignments, Papers' Reviews, and Exam Policies***

**Homework/programming assignments**

There will be homework/programming assignments, which are due at the posted deadline on D2L. Late assignments will be accepted up to one lecture later than the assigned due date with a 20% penalty. No assignments will be accepted beyond a week after the due date. The assignments must be submitted online at <https://d2l.depaul.edu>. No assignments will be accepted via e-mail.

***Midterm:***

There will be a midterm exam given on Wednesday, October 12<sup>th</sup>. The midterm is a closed book and notes exam, but students are allowed to bring a calculator (no phones or internet connected devices are allowed).

***For online students:***

Online students must schedule their midterm and final exam on the D2L website (<https://d2l.depaul.edu>) during the time frame specified by your instructor (Midterm: October 8<sup>th</sup> – 11<sup>th</sup>, Final Exam – November 19<sup>th</sup> – 21<sup>st</sup>). Students living within the Chicago land area are considered local and will be expected to take their exams at a DePaul University campus. Time slots vary by campus and day. Given the number of

students in the in-class section, there may not be room to allow online students to take the exam with the other in-class students. Online students living outside the Chicago land area (remote) will have their exams administered by a qualified proctor. You will need to find an acceptable proctor in your area before you register for your exam.

### ***What to Expect***

As with any course in mathematics and computer science, you are expected to spend a significant amount of time outside of class reviewing lectures and working on homeworks/projects. The best way to learn mathematical or statistical techniques is to experiment with them on a variety of problems. You will, of course, have a range of problems posed on the homeworks, but the more you can experiment with these techniques on both real and synthetic datasets, the better you will learn their nuances, and the better prepared you will be to apply them in novel situations.

The topics in this course build on each other, much in the same way as in any programming or math course. Be sure to monitor your progress carefully in this course and come see me immediately if you miss a class or start to fall behind so that we can discuss getting you caught up.

### ***Software***

The use of the Matlab/Octave computation system will be taught in class and will be required for some homework problems. It will be the only officially supported platform for the course.

### ***Attendance***

It is expected that you will attend every class; it is the single most important action you can take in mastering the course objectives. You are responsible for all material covered, assignments delivered or received, and announcements made in class sessions that you miss. For distance learning students, this means viewing the classes in a timely manner, participate in the discussion forums, and being sure to email or call in any questions that you have.

### ***For online students:***

Recordings of each lecture will be available a few hours after the “live” class, and can be found at the course website <https://d21.depaul.edu>. Online students are expected to watch the lectures every week and to keep up with the course information posted on the course website.

### ***Changes to Syllabus***

This syllabus is subject to change as necessary to better meet the needs of the students. Significant changes are unlikely, and will be thoroughly addressed in class. Minor changes, especially to the weekly agenda, are possible at any time. You will be informed of all such changes.

### ***School policies:***

#### ***Online Instructor Evaluation***

Course and instructor evaluations are critical for maintaining and improving course quality. To make evaluations as meaningful as possible, we need 100% student participation. Therefore, participation in the School’s web-based academic administration initiative during the eighth and ninth week of this course is a requirement of this course. Failure to participate in this process will result in a grade of incomplete for the course. This incomplete will be automatically removed within seven weeks after the end of the course and replaced by the grade you would have received if you had fulfilled this requirement.

#### ***Email***

Email is the primary means of communication between faculty and students enrolled in this course outside of class time. Students should be sure their email listed under "demographic information" at <http://campusconnect.depaul.edu> is correct.

#### ***Academic Integrity Policy***

I expect that you have read and understood DePaul's policy on Academic Integrity: <http://academicintegrity.depaul.edu/> It is part of this syllabus; follow it.

### ***Plagiarism***

The university and school policy on plagiarism can be summarized as follows: Students in this course, as well as all other courses in which independent research or writing play a vital part in the course requirements, should be aware of the strong sanctions that can be imposed against someone guilty of plagiarism. If proven, a charge of plagiarism could result in an automatic F in the course and possible expulsion. The strongest of sanctions will be imposed on anyone who submits as his/her own work a report, examination paper, computer file, lab report, or other assignment which has been prepared by someone else. If you have any questions or doubts about what plagiarism entails or how to properly acknowledge source materials be sure to consult the instructor.

### ***Incomplete***

An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final, and approved by the Dean of the School of Computer Science, Telecommunications and Information Systems. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request. Students must formally request an incomplete by filling out a Request for Incomplete Grade form, available at the CDM main office, and submitting it to me.

### ***Resources for Students with Disabilities***

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted either:

PLuS Program (for LD, AD/HD) at 773-325-4239 in SAC 220

The Office for Students with Disabilities (for all other disabilities) at 773-325-7290 Student Center 307