Numerical Computations
http://www.cse.psu.edu/~madduri/teaching/CMPSC451

Instructor. Prof. Kamesh Madduri, 343E IST Building, [madduri at cse.psu.edu] 814-865-0883. Office hours: MW 1.30–2.30 PM (343E IST), F 1.30–2.30 PM (online on Skype, madduri.451.officehours), or by appointment [madduri.org/cal].

Teaching Assistant. Ping Chi, [pzc139 at psu.edu]. Office hours: TTh 1.00–2.00 PM (338E IST).

Class Overview and Objectives. This class introduces students to key ideas behind numerical computation, with emphasis on the implementation of common numerical methods. CMPSC/MATH 455 is a related course that covers a subset of the topics that we will study in this class. Students may obtain credit for either this class or CMPSC/MATH 455, but not both.


Prerequisites. Three credits of programming; MATH 230 or MATH 231.


Class Material. All class presentations, lecture notes, and homework assignments will be posted on Penn State’s Angel CMS. Please keep checking the class Angel page frequently for news and announcements, and send email through Angel.

Evaluation and Grading. The final grade will be based on five homeworks, two in-class evening midterm examinations, class attendance, and a comprehensive final exam.

Homeworks 45%
Midterm 1 15%, September 26 (109 Osmond, 6.30–7.45 PM)
Midterm 2 15%, October 31 (109 Osmond, 6.30–7.45 PM)
Final Exam 20%
Attendance 5%

Please let me know as soon as possible if you will need to reschedule an exam, or have any special needs during the semester.
**Homework Assignments.** Most of the homeworks will be due one week after they have been handed out. Please submit them via Angel before the start of the class, or hand them over to me in class. Each homework will be worth 10 points, and I will assign a 50% weighting to the least score of the five homeworks. For instance, if your individual homework scores are 10, 10, 6, 10, and 10, your final homework grade will be 43 out of 45. Some of the homeworks will include problems that require MATLAB programming, and the code should be submitted electronically. Late homework submissions will generally not be accepted. Please contact me at least two days in advance in case you won’t be able to meet a deadline.

**Attendance Policy.** I strongly encourage students to attend the lectures. Please let me know if you will be missing multiple classes for legitimate, unavoidable reasons. I will periodically take a roll call in class, and will use the aggregate attendance count for your 5% class attendance grade.

**Schedule.** The lecture numbers on Angel will be based on the three 50-minute lectures on Monday, Wednesday, and Friday. We will be following the textbook chapter ordering for most of the course, and I will provide section references corresponding to the material covered in class after each lecture. Here is a tentative schedule (until the start of November) of lectures, homeworks, and topics covered:

- **Aug 22–Aug 29.** Introduction, Approximations, Floating point arithmetic
- **Aug 31–Sep 19.** Systems of Linear Equations
- **Sep 2–9.** Homework #1
- **Sep 16–23.** Homework #2
- **Sep 26.** In-class midterm Exam 1 (covering material in Homeworks #1 and #2)
- **Sep 21–Oct 7.** Non-linear equations
- **Oct 7–Oct 14.** Homework #3
- **Oct 10–Oct 19.** Interpolation
- **Oct 21–Oct 28.** Homework #4
- **Oct 19–Nov 2.** Numerical Integration and Differentiation
- **Oct 31.** In-class midterm Exam 2 (covering material in Homeworks #3 and #4)

**Academic Integrity.** Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others. Students must abide by the administrative policy for academic integrity (please see [http://www.psu.edu/oue/aappm/](http://www.psu.edu/oue/aappm/)). Students should independently perform the homework assignments, and no collaboration is allowed (even with students of the other section). Avoid plagiarism ([http://tlt.its.psu.edu/plagiarism/tutorial](http://tlt.its.psu.edu/plagiarism/tutorial)), and please contact me first if you are in doubt. You can contact the TA if you have any questions about the homework assignments, and for getting started with the programming assignments.