CMPE 380- Applied Programming

Prerequisites:

MATH-241 Linear Algebra and CMPE-250 Assembly and Embedded Programming, or equivalent courses

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Office Hours Posted in MyCourses
(alternatively set an appointment via email)

Grader Posted in MyCourses

Course Description

This course uses the C language to implement algorithms used in the numerical solution of common problems encountered in science and engineering. Topics include an introduction to C, computer number representation and roundoff error, algorithms for finding roots of nonlinear equations, interpolation, threading, software security, numerical differentiation and integration, function approximation and data fitting solutions to systems of linear equations, and general matrix manipulation.

Textbook

- *A First Course in Numerial Methods,* U.M. Ascher and C. Greif, SIAM, 2011 (ISBN 978-0-898719-97-0). NOT REQURIED

References

- *Practical C Programming,* S. Oualline, O'Reilly, 3rd ed., 1997 (ISBN 1-56592-306-5).
- *The C Programming Language,* B.W. Kernighan, D.M. Ritchie, 1988

(Additional references, including e-books, etc., posted in MyCourses)

Main Course Objectives

1. Improve your proficiency in the use of the C language.
2. Be able to recognize factors that make C code more efficient and portable.
3. Be able to recognize and overcome limitations due to finite precision arithmetic in numerical computations.
4. Be able to select suitable algorithms to numerically solve common engineering problems.

Assessment

- ***Lab Assignments*** will be used as the primary form of assessment for the first and second objectives.
- ***Weekly Online Quizzes*** will be used to assess all the objectives.

Homework

Programming cannot be learned simply by attending lectures and reading, ***weekly assignments*** will be given to achieve this objective. Some homework assignments may require more than one week to complete.

- Homework assignments will be announced in class and posted on MyCourses. Homework must be submitted, as directed, on or before its submission deadline. Note that homework constitutes 88% of the overall grade.
- All students must ***individually*** complete the homework assignments. Copying of assignments (including portions of code from somewhere or someone else) is a violation of the code of ethics and will result in at least no credit, *e.g.,* zero, in the assignment and possibly in disciplinary action.
- There will be **no makeup** for pre-lab and or interactive exercises.
- **Late homework** . For full credit Homework assignments must be received by the due date posted in the DropBox. Late homework can still be submitted to the DropBox but there will be a 10 point penalty per day in the grade. After 5 days, no more late homework will be accepted (100 point penalty). Exceptions may be considered in *extreme cases* but only if properly documented and arranged ***before the deadline***.

Final

- There will be no final, but the last lab will be due during finals week.

Grading

Homework	84 %
Weekly Online Quizes	16 %

More details will be given in class. The instructor reserves the right to change the relative grading weights.

Academic Honesty

Although students are strongly encouraged to work together to learn the course material, all students are expected to complete graded homework, quizzes and any other graded assignments individually. No credit will be given for work not completed independently and completely by that student. Copying assignments or parts of assignments from others is not permitted; all students involved in copying will receive a grade of zero for at least the copied assignments, regardless of who copied from whom.

If you have any questions about this policy, please see me to discuss it in further detail. All conduct in this course will be governed by *RIT Policies and Procedures on Academic Honesty*. Additionally, it is expected that students will respect their peers and the instructor such that no one takes unfair advantage of anyone else associated with the course.

Attendance

Due to the nature of the course class attendance is very important for your success and hence mandatory. Lectures may include material that is not included in the book or handouts. For best results, our interactions during lectures should be based on the ***mutual understanding that all material previously discussed in class has been studied and reviewed before class***. The importance of attending class and taking good notes cannot be overstated. I may take attendance randomly.

Announcements and Communication

MyCourses will be used as a repository for notes, homework and other resources for the course. Homework grades will also be posted here. The "Email" component of MyCourses will be used for both broadcast and individual messages regarding this course matters such as cancellations or changes of office hours, updated notes, etc..

When you send me email please ***make sure to address me correctly***, for example Professor Repka - as opposed to Hey. Also choose a meaningful Subject line and include a signature. I need to know your name! I will respond to your email as quickly as possible unless the email was sent at late hours in which case you should expect a response early next day. I normally respond to email during weekends.

Ethics, Professionalism and Etiquette

It is expected that all students will behave in a **professional manner**. Here are some fundamental guidelines that summarize my expectations:

- When the professor arrives **stop talking** and prepare to take notes and ask questions.

- You are expected to **arrive on time** and not to leave until the class is over. If you need to leave earlier, let me know at the beginning of class.
- **Turn off** cell phones, alarm gadgets, MP3 players, etc, at the beginning of class.
- Please refrain from talking aloud during lectures.
- Observe the IEEE code of ethics (www.ieee.org/about/corporate/governance/p7-8.html)

Students with Disabilities

"RIT is committed to providing reasonable accommodations to students with disabilities. If you would like to request accommodations such as special seating or testing modifications due to a disability, please contact the Disability Services Office. It is located in the Student Alumni Union, Room 1150; the Web site is www.rit.edu/dso. After you receive accommodation approval, it is imperative that you see me during office hours so that we can work out whatever arrangement is necessary."

Title IX

RIT is committed to providing a safe learning environment, free of harassment and discrimination as articulated in our university policies located on our governance website. RIT's policies require faculty to share information about incidents of gender based discrimination and harassment with RIT's Title IX coordinator or deputy coordinators when incidents are stated to them directly. The information you provide to a non-confidential resource which includes faculty will be relayed only as necessary for the Title IX Coordinator to investigate and/or seek resolution. Even RIT Offices and employees who cannot guarantee confidentiality will maintain your privacy to the greatest extent possible.

If an individual discloses information during a public awareness event, a protest, during a class project, or advocacy event, RIT is not obligated to investigate based on this public disclosure. RIT may however use this information to further educate faculty, staff and students about prevention efforts and available resources.

If you would like to report an incident of gender based discrimination or harassment directly you may do so anonymously by using the online TIX report form or anonymously by using the Compliance and Ethics Hotline.

About Learning and Learning Styles

"Learning is a matter of attitude, not aptitude"

Georgi Lozanov

- You are **in charge of your own learning**.
- To maximize your learning effectiveness it can be useful for you to **be aware of your preferred learningstyles**. One way to do this is to use the "Index of Learning Styles" (ILS) to assess your learning preferences. This learning style model has four dimensions: (**active/reflective, sensing/intuitive, visual/verbal, sequential/global**). This instrument was developed by Richard M. Fielder and Barbara A. Solomon of North Carolina State University. Both an on-line version and a pencil-and-paper version may be accessed from http://www.ncsu.edu/felderpublic/ILSpage.html
- An interesting book about "learning how to learn" is *Peak Learning*, by Ronald Gross (ISBN 0-87477-957-X). You might find it interesting and useful. Remember that one of the reasons you are at RIT is to **become a lifelong learner.**