Numerical Analysis MCS 471 Fall 2020

Name: Dr. Gerard Awanou

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Course Webpage: http://www.math.uic.edu/~awanou/MCS471

Office hours: (through Blackboard Collaborate) M W F 12:00 pm – 12:50 pm, and by appointments.

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Biography: I'm an associate professor in the department of Mathematics, Statistics, and Computer Science. I received my Ph.d in mathematics in 2003 from the University of Georgia and spent two years as a postdoctoral associate at the Institute for Mathematics and its Applications, University of Minnesota. I then worked at Northern Illinois University for seven years before coming to UIC in 2012. My research interests are primarily in the numerical analysis of partial differential equations. In 2009, I was awarded a Sloan fellowship.

Course information: M W F 10:00 am - 10:50 am ONL

Course Method of Instruction: Synchronous, through Blackboard Collaborate

Course Technology Requirements personal computer, broadband Internet connection. You may contact ACCC to request and borrow a laptop or be assigned a hotspot for the semester if you do not have the required hardware and internet capabilities.

Textbook: Numerical Analysis by T. Sauer; 2nd edition.

Prerequisite: Basic computer science, multivariable calculus and matrix algebra.

Credit hours: 3 or 4

Course goal and objectives: Discuss and present methods for solving mathematical problems with computers. Students learn how to implement and present solution to problems arising in science and engineering applications.

Drop and Withdrawals: All drops of or withdrawals from courses must be accomplished before the applicable deadline indicated in the Schedule of Classes.

Homework due dates: C stands for Computer problem. Homework will be uploaded to gradescope.

Hwk 1 Due F Sept 11. Section 0.1 #3, C1. Section 0.3 #3, 10. Section 0.4 #1, 4, C1, C3. Section 1.1 #6, C2. Section 1.2 #6. Section 1.4 #8, C2. Section 1.5 C1.

Hwk 2 Due F Oct 02. Section 2.2 #2(a,b), 4, C1, C2. Section 2.4 #4 a. Section 2.5 C2, C3, C4.

Hwk 3 Due F Oct 23. See gradescope.

Hwk 4 Due F Nov 06. See gradescope.
Late homework will be accepted only under special circumstances and with prior approval and will be discounted by 50 %. Homeworks with a coding component may be done in Matlab and the final output in readable form should be attached to the body of the homework. In addition you may be asked to email the m-files. You must follow the template given here: http://faculty.washington.edu/rjl/fdmbook/latex/hwsample.pdf

Exams: There will be one take-home midterm exam and a take-home final exam.

Grade distribution: 400 points homework, 200 points midterm, 400 points final.

Tentative schedule: No class M Sept 7 and F Nov 27. **Midterm F Oct 16. Final exam Dec 7–Dec 11**. Instruction ends F Dec 4.

Floating point arithmetic (Chap 0, 3 lessons). Solving equations (Chap 1, 3 lessons). Computational linear algebra (Chap 2, 9 lessons) Interpolation (Chap 3, 2 lessons). Numerical differentiation and integration (Chap 5, 4 lessons). Numerical solution of ODEs (Chap 6, 5 lessons). Boundary Value Problems (Chap 7, 3 lessons) Numerical solution of PDEs (Chap 8, 9 lessons). Cubic splines and nonlinear partial differential equations (3 lessons).

Attendance policy: Students are expected to attend each lecture and participate. Your grade will be lowered by one letter grade if you miss 25 % or more of the lectures.

Academic Honesty and Civility in the Classroom: Academic honesty and mutual respect (student with student and instructor with student) are expected in this course. Your assignments must be written by yourself and not shared with others. Academic misconduct and incivility in the classroom, as defined by the Student Disciplinary Policy, will not be treated lightly.

Disability services: If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me within the first two weeks of class.

Privacy Notification and Policy for Video Recording of Synchronous Class Sessions: We will be recording the class sessions, or portions of the class, for students who are unable to attend synchronously. The recording feature for others is disabled so that no one else will be able to record this session through Zoom, Blackboard Collaborate, Webex, or Echo360. Recording by other means is not permitted. The recorded class sessions will be posted on our Blackboard class website unless otherwise notified.

If you have privacy concerns and do not wish to appear in the recording, turn OFF your video and notify me in writing (via email) prior to the next class session. If you prefer to use a pseudonym instead of your name, please let me know what name you will be using, so that I can identify you during the class session. If you would like to ask a question, you may do so privately through the chat feature by addressing your question to me or your TA only (and not to "everyone"), or you may contact me or your TA by another private method, which we will agree upon in advance of class. If you have questions or concerns about this video recording policy, please contact me before the end of the first week of class.

Disclaimer: This syllabus provides a general guide for the course: deviations may be necessary. Deviations from the textbook should be expected.