

MATH 609-601: Numerical Analysis, Fall 2009

Instructor: Guido Kanschat, Blocker 505C, email: kanschat@tamu.edu

Class hours: Tuesdays/Thursdays 9:35–10:50am, BLOC 161; Lab: Wednesdays, 1:50–2:40pm, BLOC 122

Office Hours: Tuesdays/Thursdays 2–3pm and after appointment by email

Textbook: Stoer, Bulirsch: Introduction to Numerical Analysis, 3rd edition.

Syllabus: This class introduces some of the fundamental concepts of numerical analysis: consistency, stability, approximation, orthogonality and contractions. They are studied as essential analytical tools applied to problems like interpolation, quadrature, and iterative solution methods. In the second part of the class, we will study numerical methods for ordinary differential equations.

The class will cover selected material from the textbook.

Objectives: After finishing this class successfully, you will have learned about the basic concepts as well as techniques in numerical analysis. You will be able to identify the arguments used in proving the properties of numerical methods. You will also have gained experience in implementing numerical methods and assessing their quality from numerical experiments.

Homework: There will be weekly homework assignments and programming assignments to be completed in the lab sessions or at home. On the first assignment, you will be asked to form a group of 3–4 students which meets and discusses homework together; this group should remain the same for the whole semester and should also collaborate on the programming assignments. You should still submit homework individually, but list the other group members next to your name. Programming assignments should be handed in by the group. They include the source code of the running program, sample output, and every group should be prepared to explain details to the teaching assistant.

The purpose of these homework assignments is that you obtain practice in the techniques discussed in class as well as in writing your solution in a form which allows a reader to follow your thoughts. Solving the problems diligently is therefore a vital component of your learning experience and will also prepare you for the exams. Furthermore, the ease with which you address homework assignments will predict your performance in exams. If you find your homework difficult or are not satisfied with your homework grades, please see me in my office as soon as possible.

Homework assignments will be graded according to the following scale: (A) almost or totally correct and well written; (B) almost or totally correct, but lacks in presentation; (C) decent but deficiencies in content and form; (D) serious attempt, but severe deficiencies; (E) attempt; (F) missing.

The total homework grade is computed as the median of the assignments with two exceptions: if three or more assignments are (E) or below, the total grade will not be more than (E). If you have more than one unexcused (F), the total grade is (F).

Exams: two take-home midterms, due

- First midterm exam, Thursday, October 20th
- Second midterm exam, Thursday, November 24th
- Comprehensive final exam, Friday, December 11th, 12:30–2:30pm for changes)

Please bring your own paper to the exam; paper should be white, yellow or engineering paper; please avoid strong colors.

Grades: Your grade will be at least A, B, C or D for point averages over 90%, 75%, 60% or 45%, respectively. The point averages will be computed from homework, programming assignments, the final exam, and the midterm exams with a 20% weight each.

Before the final, I will compute a preliminary grade as the average of both midterm exams. If you are satisfied with this grade and your total homework grade is equal or above, you can notify me and you will not have to take the final exam to receive this grade.

Make-ups : There will be no make-up exams. Excused absences according to Rule 7 (see Student Rules) will be dealt with on an individual basis, but require a written excuse. Please let your instructor know about this as soon as possible, and preferably in advance.

Incompletes: I will consider giving an incomplete if you have successfully completed all but a small portion of the work of the course, and are prevented from completing the course by a severe, unexpected event. Simply being behind work is not a reason for an Incomplete. In that case you should consider dropping the course.

Academic integrity: The Aggie Honor Code “An Aggie does not lie, cheat or steal, or tolerate those who do” applies, see also the Honor Council Rules and Procedures at <http://www.tamu.edu/aggiehonor.html>
Students are strongly encouraged to work together and discuss homework problems with each other. However, copying or stealing work done by others is an act of academic dishonesty and will be persecuted according to the University policy.

Disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities.

If you believe you have a disability requiring an accommodation, please contact Services for Students with Disabilities, Koldus 126, 845-1637 as early as possible in order to find the best solution for you.

Important web pages: <http://www.math.tamu.edu/~kanschaf/teaching/2008C-308/> Course homepage
<http://studentaffairs.tamu.edu/emergency> Campus Emergency Information
<http://www.math.tamu.edu/teaching/operationspg.html> Dept. of Mathematics, teaching op.
<http://www.math.tamu.edu/> Department of Mathematics
<http://disability.tamu.edu/> Disability Services
<http://student-rules.tamu.edu/> Student Rules
<http://www.tamu.edu/aggiehonor.html> Aggie Honor Code

Email policy: I will answer all emails within a week. While I will not guarantee this, I will attempt to answer all emails asking for appointments within 24 hours and all others within 48 hours. Please refer to the class number in the subject and try to give a concise description of your problem.

Copyright: All materials disseminated in class or on the web are protected by Copyright laws. Copies (or download from the web) are allowed for personal use only. Distribution of any of these materials in any form is strictly prohibited.

Disclaimer: While this handout was prepared carefully and according to information available at the beginning of the semester, changes may be necessary in the interest of good teaching. Changes to any of the information above will be announced in class and posted on the class web site. This includes in particular possible changes of exam dates.