

Course Information

(Last Revised on August 15, 2019)

1. General Information

Professor: Thanh Thieu, Ph.D.
Office Location: Room 116-A
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Office Hours: Tuesday 3:30 – 5:00
Thursday 3:30 – 5:00
(or by appointment)

Course Site: <https://canvas.okstate.edu/courses/40253>

2. Course Description

CS 3513: Numerical Methods for Digital Computers. Prerequisites: MATH 2153 (Calculus II); MATH 3013 (Linear Algebra) or concurrent enrollment; or MATH 3263 (Linear Algebra and Differential Equations) and knowledge of programming. Errors, floating point numbers and operations, interpolation and approximation, solution of nonlinear equations and linear systems, condition and stability, acceleration methods, numerical differentiation and integration.

3. Course Materials and References

- Lecture Notes: J. P. Chandler. *Elements of Numerical Computation*. Recent Edition (2010).
- References:
 - W. Cheney & D. Kincaid. *Numerical Mathematics and Computing (7th Edition)*. Cengage 2013.
 - J D Faires & R L Burden. *Numerical Methods (4th Edition)*. Cengage 2012.
 - C. Moler. *Numerical Computing with MATLAB (Web edition)*.
<https://www.mathworks.com/moler/chapters.html>.

4. Homework and Examinations

There will be about 3 homework/programming assignments, 2 mid-term, and 1 final examination.

5. Course Grade

The course grade is based on the homework (35%), mid-term (30%), and final examination (35%). The passing letter-grade is determined by the following partition of the course grades:

D : [50, 60); C : [60, 70); B : [70, 85); and A : [85, 100]

6. Miscellaneous

- **Lectures:** Lectures are not mandatory, but historically, students with active attendance have done significantly better on examinations than their less frequently attending classmates.
- **Homework:** Problem sets form an important part of the learning in the course, and thus, you are required to do them in order to pass.
- **Collaboration:** You are encouraged to collaborate in study groups on the solution of the homework. If you do collaborate you must write up solutions on your own and acknowledge your collaboration in the write-up for each problem. If you obtain a solution with help (e.g., through library work, another student, etc.), acknowledge your source, and write up the solution on your own.

7. Student Disability Services

Student Disability Services and other Student Services are committed to providing support services to students with physical and learning disabilities. Please advise the instructor of desired academic accommodations, and notify Student Disability Services.

8. Academic Dishonesty or Misconduct

Refer to the section in “University Academic Regulations” in current “University Catalog”
<http://registrar.okstate.edu/>

9. Adding/Dropping/Withdrawing, Important Dates, and Syllabus Attachment

- **Examination:**
Final examination: 2:00-3:50pm on Tuesday, December 10, 2019
Location: Regular class meeting place.
Refer to block “TR 2:00pm” in “Spring 2019 Final Exams” at:
<http://registrar.okstate.edu/Exams>
- **Adding/Dropping/Withdrawing and Important Dates:** Refer to the section in “Academic Calendar”:

<http://registrar.okstate.edu/>

- **Syllabus Attachment:** Refer to:
<http://academicaffairs.okstate.edu/content/resources-students>

Class Schedule (Tentative)

| Week | Chapter | Topic |
|---------------------|-----------------------------------|---|
| Aug 20 | Overview, logistics, introduction | |
| 22 | 1 | Errors |
| Aug 27 | 1 | |
| 29 | 2 | Floating Point Numbers and Arithmetic |
| Sep 3 | 2 | |
| 5 | 2 | |
| Sep 10 | 2 | |
| 12 | 3 | Taylor Series and Numerical Differentiation |
| Sep 17 | 3 | |
| Homework 1 complete | | |
| 19 | Mid-term 1 | |
| Sep 24 | 4 | Roots of Nonlinear Equations |
| 26 | 4 | |
| Oct 1 | 4 | |
| 3 | 4 | |
| Oct 8, | 5 | Accelerating Convergence |
| 10 | 5 | |
| Oct 15 | 6 | Condition and Stability |
| 17 | 6 | |
| Oct 22 | 6 | |
| 24 | 6 | |
| Homework 2 complete | | |
| Oct 29 | Mid-term 2 | |
| 31 | 7 | Systems of Linear Equations |
| Nov 5 | 7 | |
| 7 | 7 | |
| Nov 12 | 7 | |
| 14 | 8 | Interpolation and Extrapolation |
| Nov 19 | 8 | |
| 21 | 9 | Approximation and Definite Integrals |
| Nov 26 | 9 | |
| Homework 3 complete | | |
| 28 | Thanksgiving | |
| Dec 3 | TBD | |
| 5 | Review | |
| Dec 10 | Final Examination, 2:00-3:50pm | |