MATH478: Computational Mathematics

Syllabus for Fall 2019

Instructor: Longfei Li
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Lecture: MWF 09:00 AM - 09:50 AM, Maxim Doucet Hall 212
Office Hours: MWF 10:00 AM - 10:50 AM or by appointment, Maxim Doucet Hall 433

References (there is no required text):

1. *Learning MATLAB*, Tobin A. Driscoll.
2. *Numerical Python: Scientific Computing and Data Science Applications with Numpy, SciPy and Matplotlib (2nd Edition)*, Robert Johansson.
3. *Learning R: A Step-by-Step Function Guide to Data Analysis*, Richard Cotton.
4. *An Introduction to Statistical Learning: with Applications in R*, Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani.
5. *High Performance Scientific Computing (AMATH 483/583 course materials, Spring Quarter, 2014, University of Washington)*, Randall J. LeVeque.
6. *The Python Tutorial*, Guido van Rossum and the Python development team.
7. Fortran 90 Tutorial, Michael Metcalf.
8. Numerous resources are avaible online for free.

Course Description: Topics include numerical methods for hyperbolic, elliptic and parabolic PDEs; analysis of finite difference schemes; well-posed and stable initial-boundary value problems; GKS/normal-mode analysis.

Academic Dishonesty: If I believe a student is performing academic dishonesty, I will collect evidence as I see fit and it will be handled according to the University's code of conduct found at http://studentrights.louisiana.edu/student-conduct/code-conduct.

Online Resources: Moodle is the main online resource of this course. Solultions and important announcements will be posted there throughtout this semester. So please check Moodle regularly.

Class participation: Class participation is expected. Each of you will have a chance to present some topics for the whole class. Class participation consists of 40% of the final grades.

Projects: There will be one project that consists 30% of the final grades. A typed-up project report with necessary figures and codes should be turned in for each project. No report will be accepted after due date unless a written documented excuse is provided.

Final Project: There will be a final project (weighs 30%). You are expected to find a problem of your interest and use the numerical techniques from this course to solve the problem. You need to submit a proposal and make an oral presentation of the problem you plan to work first. Once your proposal is approved, you need to work on your project and turn in a final report before the end of the semester.

Grading Weights:
Grades Scale:

Class participation	Project (1)	Final Projects (1)	Total
40%	30%	30%	100%

Grade	A	B	C	D	F
Percentage	90% – 100%	80% – 89 %	70% – 79 %	60% – 69 %	<60%