

1 Course No.: Math 536	Core Course: yes
Course Title: Numerical Analysis of PDEs	Term: Winter
Instructor: Peter Minev	
<p>Syllabus: Numerical solution of linear algebraic systems: direct methods, classical iterative methods, conjugate gradients and the domain decomposition techniques.</p> <p>Finite difference methods for elliptic, first order hyperbolic and parabolic PDE's. Convergence, consistency and stability. Applications to problems in science and engineering.</p> <p>Finite element methods for elliptic and parabolic equations. Convergence analysis.</p> <p>Prerequisites: The required background includes undergraduate courses in Linear Algebra, PDE's and Numerical Analysis. You must be capable in writing a computer code in at least one programming language, and also be familiar with standard visualization software (e.g. Matlab, Maple etc.) for presentation of your numerical results.</p> <p>Textbook(s): M.B. Allen III and E.L. Isaacson, Numerical Analysis for Applied Science, John Wiley & Sons, 2nd edition, 2019, ISBN: 978-1-119-24565-0.</p> <p>Course notes are also available on the web site of the instructor.</p> <p>Grading: Assignments (approximately 5): 20%</p> <p style="padding-left: 40px;">Midterm examination: 30%; in case a student scores on the final exam better than on the midterm, all the weight of 80% will be moved to the final exam grade.</p> <p style="padding-left: 40px;">February 10, 3 pm-6 pm.</p> <p style="padding-left: 40px;">Final examination: 50%; it will cover the entire material.</p> <p style="padding-left: 40px;">April 9, 10 am-2 pm.</p> <p>Assignments: There will be (approximately 5) bi-weekly assignments throughout the term. These assignments will contain mostly computational problems involving a lot of programming. They are due on the day before the second last lecture of the term. During the last two lectures all students will make a presentation based on their assignments. They should be prepared to answer questions on their presentation and the course material related to it. The programming languages are preferably, but not limited to, Fortran, C (C++), Python, or Matlab (in Matlab or Python, no use of their linear algebra routines is allowed). No collaboration on assignments is allowed.</p>	

