MA451 Syllabus
Methods of Applied Mathematics II
Spring 2019

R&R Description: The mathematical methods of this course give insight into physical continuum processes such as fluid flow and the deformation of solid elastic materials. Techniques include the modeling and formulation of equations of motion, the use of Lagrangian and Eulerian variables; further topics are: examples of incompressible fluid flow, calculus of variations and applications to optimal control problems.

Instructor: Dr. Mansoor Haider, SAS 3280, 515-3100, m_haider@ncsu.edu

Time/Place: 1:30-2:45 T/Th, SAS 1220

Office Hours: Tuesdays 11:30-12:30, Thursdays 10:30-11:30, or by appointment

Prerequisites: MA 341

Textbook: *Introduction to the Foundations of Applied Mathematics* by MH Holmes, Springer, 2009 [required, available as e-book from the NCSU Library]

Webpage: http://wolfware.ncsu.edu

Grade: **Homework (25%) + 2 In-class Tests (40%) + Final Exam (35%)**
Final grades will be assigned using the following grading system:

A+:[98,100]	A:[92,98)	A-:[90,92)
B+:[88,90)	B:[82,88)	B-:[80,82)
C+:[78,80)	C:[72,78)	C-:[70,72)
D+:[68,70)	D:[62,68)	D-:[60,62)
F:[0,60)		

Homework: Homework assignments will be given every 7-10 days. For each homework assignment, a subset of the problems will be graded and solutions posted after the assignment is returned.

Tests: **Two in-class tests** will be given on the following dates: **Thursday Feb. 21st** and **Thursday Apr. 11th**.

Final Exam: Tuesday April 30th, 1:00-4:00pm

Topics: I. Foundations of Continuum Models (one spatial dimension)
II. Modeling Elastic & Viscoelastic Solids (one spatial dimension)
III. Foundations of Continuum Mechanics in Three Spatial Dimensions
IV. Modeling Fluids & Solids in Two or Three Spatial Dimensions
V. Introduction to the Calculus of Variations
VI. Introduction to Optimal Control

Reading: Unless stated otherwise in lecture, you are expected to read the sections of the textbook or other source material corresponding to the topics covered in the lectures.

Attendance: Although attendance will not be taken, regular attendance at lectures is critical for success in this course. The instructor will not use office hour time to re-teach

material that is poorly understood due to non-attendance at the lectures. You should also view the NCSU Attendance Regulations.

Laptops: If you have a laptop computer with you during the lecture period, it must remain closed. Students with a compelling reason for an exception to this rule should contact the instructor.

Evaluations: Online class evaluations will be available for students to complete during the last 2 weeks of the semester for full semester courses and the last week of shorter sessions. Evaluations then become unavailable at 8 am on the first day of finals for full semester courses and the last day of classes for shorter session courses.

For full semester courses, evaluations will be available:

8 am April 15th, 2019 through 8 am April 29th, 2019

Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will not know how any one student responded to any question, and students will not know the ratings for any instructors.

Evaluation website: http://go.ncsu.edu/cesurvey
Student help desk: classeval@ncsu.edu
More information about ClassEval

Integrity: Please read and adhere to the NCSU Code of Student Conduct

Disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information on NC State's policy on working with students with disabilities, please see the following link