First Year Seminar: The Mathematics of Voting (FYS 100-X) Syllabus, Fall 2008

Professor: **Dr. Jason Parsley**
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1. Course Time & Location: MWF 12-1, Manchester 245

2. Primary text: Jonathan Hodge and Richard Klima, *The Mathematics of Voting and Elections*, AMS, 2005

Supplementary texts: Donald Saari, *Chaotic Elections!: A Mathematician Looks at Voting*, AMS, 2001.

- Alan Taylor, *Social Choice and the Mathematics of Manipulation*, MAA, 2005.

- selected articles and other readings distributed throughout the semester

3. Course description: Voting and its quagmires have heavily influenced politics in the 21st century. In this course, students will examine the foundations behind voting, be it for political candidates or for toppings on a pizza. One striking result quickly encountered is Arrow's Impossibility Theorem: except for a dictatorship, any voting system among three or more persons must inevitably fail one of a few natural criteria, which one would expect to hold in any election. We will examine the strengths and weaknesses of several voting systems, including (1) majority rule, (2) a Borda count method (similar to many sports polls), (3) approval voting, and (4) instant runoff voting, which several states (including possibly North Carolina) and municipalities have recently adopted. We will also study the Electoral College and other examples of weighted voting systems. Much of our data will topically be taken from the November elections. Students will work directly with exit-polling data and predict outcomes of these races and the accuracy of their projections. Some readings will address the current debate regarding electronic voting machines. Students will explore a voting topic in greater depth for a final project.

4. Goals. In this seminar, students will

- explore an important current issue, voting, during the election year of 2008; students will learn to think, speak, and write critically about elections, and hopefully come to understand the pursuit of fair elections as a vital nonpartisan concern in a democracy

- intertwine ideas from mathematics and political science to comprehend voting theory

- actively (generate and) interpret polling data through which they will gain personal ownership of this topic

This course will be a working seminar, which will ask you to read, to write and to discuss. There will be 3 formal writing projects, as well as some short reaction papers.

5. Writing projects. You will complete three written projects. The first and third ones will be peer-reviewed.

1. *Voting Systems* (3-5 pages) Choose from a variety of topics (to be distributed later) pertinent to chapters 1-6. First draft due: *M., Oct. 6th*; final draft due *M., Oct. 13th*

2. *November Election* (5-7 pages) We will explore the November election in Forsyth County, take exit surveys of voters, and match our results/predictions to official election data. Due *F., Nov. 14th*

3. *Final paper* (8-10 pages) Researching a topic of your choice (see suggested list), construct a cohesive final paper, which can be expository or persuasive in nature. First draft due *F., Dec. 5th*; final draft due *Th., Dec. 11th*

6. Homework: There will be homework, in many formats, for this seminar.

- 1-2 page (typed) reaction papers, which may involve some out-of-class investigation.

- some voting related calculations

- investigate some voting topic and write a quick paragraph on your findings, and post for the class to read

- after reading an article, post comments and/or questions for discussion in class

We will utilize the discussion board feature of Blackboard for class discussions and postings.

Homework will be graded as follows: calculations and investigations will be worth 2-5 pts each; reaction papers will each be worth 20 points: ($\sqrt{+}$ 20/20, $\sqrt{}$ 17/20, $\sqrt{-}$ 14/20). The comments/questions on the readings will factor into your participation grade.

7. Class presentations: In pairs, you will be responsible for leading class discussion on one topic drawn from chapters 6, 7, 8, or 10. You will provide a quick summary of the material (definitions, etc.), provide examples or cases (not from the book), and then lead a class discussion. You will assign the class 2-3 homework problems (not from the book), and submit typed solutions. The class will rate your performance.

8. Grade Calculation.

Homework	25%	Written Project 1	11%
Presentation	8%	Written Project 2	16%
Peer Review	5%	Written Project 3	25%
Participation	10%		

9. Attendance and Laptop Policy. Attendance will not in general be formally taken, but absences will cause your participation grade to suffer. Attendance will be taken during student presentations; unexcused absences then earn an automatic 1 point participation deduction. Laptops should only be open in class when you are asked to do so.

If you have a disability which may require an accomodation for taking this course, please contact the Learning Assistance Center (758 5929), then contact me, within the first 2 weeks of the semester.