Course Syllabus **MTH109: Politics and Mathematics** **Fall 2011**

Instructor: Dr. Faubert

Course Information

Goals of the course:

The overriding aim of this course is to provide a survey of some mathematical ideas and methods found in political settings. We will explore various voting methods for their strengths and weaknesses, fairness criteria, the benefits of insincere voting, weighted voting systems (like the Electoral College), measures of a voter's power, voter distribution models, and a strategy for choosing politically advantageous positions on key issues. We will study the effects of polls on an election, the effect a viable third political party and some ideas for voting reform. We will understand the different methods of apportionment used in the United States over its history along with their strengths and weaknesses. (Apportionment is used in determining the composition of the House of Representatives based on state populations, for example.) We will introduce an important area of mathematics called game theory and learn to distinguish total conflict from partial conflict, and when to use pure strategies and when to use mixed strategies. We will study two important partial conflict games called, "the prisoners' dilemma" and "chicken" and a model for escalation. To finish off the term, we will learn the necessary ingredients of a good political poll, how to read poll results, and how to determine the margin of error. MTH109 satisfies the quantitative general education requirement.

Text

The text for the class is For All Practical Purposes, 8th edition by COMAP, Freeman 2009. The text's ISBN is 1-4292-1506-2. It is assumed that will you have the text with you at each class meeting.

Grading

Your grade will be based on two semester tests, a final exam, written assignments (WA), classwork, and SAKAI Forum discussions as shown below. Minimum points for letter grades are also shown.

Test 1	**20%**
Test 2	**20%**
Final	**20%**
WA	**20%**
Classwork	**10%**
Forum	**10%**

Grade	**Mininum %**
A	**92**
A-	**89**
B+	**86**
B	**81**
B-	**78**
C+	**75**
C	**70**
C-	**67**
D+	**65**
D	**60**
F	**0**

Sakai

SAKAI will be used in this class for all student/teacher electronic corresponsence. Important class announcements, a gradebook, optional submission of homework, and a discussion forum will all be used.

Forum

Weekly discussion topics will be posted in the SAKAI Forum. Student particiation will be graded. A perfect discussion grade requires a timely response to the discussion prompt and a timely response to the comments of another member of the class. The response must contribute something new to the discussion and be justified with reasons or references. Every response to a post of another member of the class must respectfully agree, disagree, extend, or retract the position taken and give substantiating reasons. It must not merely repeat previous responses.

Written Assignments

Each written assignment (WA) should be thought of as a small writing project. Written assignment grades are based 20% on format and 80% on content. Start on it early. Late written assignments are accepted at most one class late and at 50% penalty. Missing class the day homework is due does not excuse its tardiness. Written documentation for excused absence must be provided for several days prior the due date to excuse tardiness. This is meant to get you to start written assignments early. Many students score lower on the written assignments than on the tests. Often this is for failing to follow the format or starting work the night before. Students may optionally submit WA's to SAKAI.

A perfect format grade requires:

1. one or at most two problems per page side (no crowding)
2. a completely written out problem statement for each problem.
3. tidy, legible exposition,
4. pages stapled together, with name and assignment number clearly shown on first page.

A perfect content grade requires:

1. the correct answer,
2. the correct work and justification,
3. a clear and precise explanation in complete sentences for worded answers.

Classwork

Classwork will consist of in-class assignments which may or may not be announced but will always be open book/notes and on recent material. Their purpose is to give you a head start on homework and to encourage attendance. Classwork need not follow the homework format. Grading will be out of 10 points, 5 points for being present and up to 5 for content. There are never make-ups for missed classwork. That would defeat its purpose. Valid written excuses are required to be exempt from classwork. (Official URI functions, doctor's note, and court summons are all valid, for example.)

Tests and final exam

The two semester tests and final exam will be given on the dates shown below. Tests are always closed book. No questions will be taken during the exam. You may have a calculator but never a cell phone on your desk during the exam. Cell phones must always be off and out of sight during exams. Cell phone interuptions during an exam will be penalized 1 point per second of interruption. Cell phones out on the desk during exam will be penalized 5 points. Cell phone use during an exam will be penalized 50 points. A missed exam requires prior notification and written documentation that satisfies the instructor before any make-up is allowed. If the make-up is not or cannot be taken then the grade for the exam will be zero.

Honor code

If you are caught breaking the URI honor code, you could be given an F for the assignment or the class. As a student of higher standards, you pledge to embody the principles of academic integrity. You may work with other students on your homework assignments as follows: You may discuss concepts, principles and methods with each other; however, you must prepare your own final submission separately. You are not to copy another student's homework. Collaboration among students is not permitted during examinations.

Disabilities

Students with special requirements and proper documentation through Disability Services should inform their instructor as early as possible. University regulations require that documentation be provided at least one week before special consideration is given.

Below is a comprehensive course outline; use it to keep up with the reading, plan your studying, find your homework assignments, know when your tests are, etc.

Course Outline and Calendar			
Date	**Text**	**Suggested Exercises (start by date)**	**Written Assignments (due in class on date)**
Sep 8	9.1	pg308 #1,2,3,5,6	
13	9.2		
15	9.2	pg308 #9,10,12,13,15	WA01 pg308 #1,2,3,6
20	9.2	pg310 #19,20,21,22,23,28,29	WA02 pg309 #12ab,16ab
22	9.3 9.4	pg311 #35,36	WA03 pg309 #12cd,16cd
27	10.1	pg328-329 #1,4ab,5,6	WA04 pg309-310 #20,22,28
29	10.2	pg329 #7,12,16,17,18,19	
Oct 4	10.3 10.4	pg330 #26,27,28	WA05 pg311 #36,pg328-329 #4ab,6
6	11.1 11.2	pg362 #1,2,3,4	
11	11.2	pg363 #6,7,8,9,10	WA06 pg329 #16,18,pg330 #26,28
13	12.1	pg400 #2,4,5,6,8,12	WA07 pg363 #2,4,6,8,10
18	***Test #1***	***Chapters 9,10,11***	
20	12.2	pg400-401 #16,20,21	
25	12.3 12.4 12.5	pg401-402 #24,25,32	WA08 pg400 #2,4,6,12
27	14.1 14.2	pg460 #5,6ab,7,8	
Nov 1	14.2 14.3	pg460 #6c,10,12,22	WA09 pg400-401 #16,20,24,32
3	14.3	pg461 #15,16,19,20,23,24	WA10 pg460 #6abc,8
8	14.4	pg461 #28,29,31,32,34	WA11 pg460-461 #12,22
10	15.1	pg502 #1,2,3,4,5	WA12 pg461 #16,20,24
15	15.2		
17	15.2 15.3	pg502 #6,7,9,10,11	WA13 pg462 #31,32,34,pg502#2,4
22	15.3	pg504 #20,21,22,23,24	WA14 pg502 #6,10, handout
24	*No Class*	*Thanksgiving break*	
29	15.4 15.5	pg504 #31,32	
Dec 1	7.1 7.2 7.3 7.4	pg237 #1,2,3,4,5,6	WA15 pg504 #20,22,24,32, handout
6	***Test #2***	***Chapters 12,14,15***	
8	7.7 7.8	pg241 #43,44,45,48	
TBA	***Final Exam***	***Chapters 7,9,10,11,12,14,15***	WA16 pg237 #2,4,6,pg241#44,48