

MGF1107 - The Mathematics of Social Choice – Spring 2010

Syllabus - Instructor: Ive Barreiros – barreiro@fiu.edu

This course satisfies the FIU's core curriculum and general Education math requirements and can be used towards an exemption from CLAST. It is intended to be of interest to students majoring in Political Sciences, International Relations, History, Social Studies Education, and Public Administration, although any students may take it.

Text: For All Practical Purposes, custom edition, by COMAP. Students may instead use the 8th edition of For All Practical Purposes. Our custom text includes just chapters 9-15 of the Full text at a cost savings to students.

Important Web sites: To be indicated

Additional readings (Case Studies and Project background)

Background Material

Unit 1 - Mathematics: Counting Principles and Formulas. Percent Structures. Growth Patterns. Arithmetic, Geometric And Harmonic Means.

Unit 2 - Probability And Statistics. Probability Distributions. Expected Value. Parameters and Statistics.

Unit 3 - The Normal distribution. The Normal table. Applications.

The Math of Social Choice.

Unit 4 – Voting Systems. Paradoxes. Weighted Voting Systems. Power Indexes.

Unit 5 – Apportioning Methods and Paradoxes

Unit 6 – Fair Division. Cake – Division Schemes. Proportionality and Envy.

Unit 7 – Competition. Basic Elements of Games Theory.

Case Studies

1. The Political, Statistical and Geographic Divisions of USA.
2. Historical and Current Populations Trends.
3. Apportionment. Historic and current events
4. Districting. Historic and current events
5. The Electoral College. Historic and current events
6. Popular and Electoral Numbers in the History of the US Presidential Elections.
7. Surveys and Opinion Polls In USA

Tests, Class work and Grading Policy. Your final grade will be determined according to your performance in quizzes, the final exam and a group project. The relative weights are given:

	Date	Weight in the Final grade
Quiz 1	15-Jan	10
Quiz 2	29-Jan	10
Quiz 3	12-Feb	10
Quiz 4	26-Feb	10
Quiz 5	12-Mar	10
Quiz 6	26-Mar	10
Quiz 7	16-Apr	10
Group Project		10
Comprehensive Final	TBA	20

Class Portfolio.

A class portfolio is **required** in this class. It will be built up with material from Internet search, as related to topics. Specific instructions will be given regarding the set up of the portfolio. The portfolio maintenance will help you to get a better grade in your quizzes. Details about the construction and use of the portfolio will be given in class.

Group discussions, lectures, and information sources are an important part of this class. Therefore your attendance is valuable to you and to the rest of the class.

Make Ups: THERE WILL NOT BE MAKING UP EXAMS. In case you miss **one (1)** quiz, the average of the rest will replace the missing grade. Failing to attend a second quiz will result in a grade of **"zero" (0)** for that quiz. The FINAL EXAM is a **comprehensive and mandatory** test that includes all material covered in class. Failing to attend the final exam will result in a grade of F in the course.

Group Project. The class will be divided in groups of three students. Each group will write a paper with a case study regarding the issues relative to our syllabus for units 4-7. Grades in group projects will be determined by presentation quality and communication effectiveness in the paper. Specific instruction for the sources, scope and length of the papers will be announced in class.

Resources. This course will require the use of a calculator, intensive Internet search, writing a paper and the construction of a class portfolio. Help in mathematics, Internet search and other assistance is available at the University Learning Center (Academic I – Room 160).

Class environment. Active and positive participation in class will be highly appreciated. Punctuality is important as well as attendance to the whole session in each class. Avoid private conversations, as well as computers and cell phone use during class. Eating and/or drinking in class neither are not permitted. Your instructor will promptly observe and report any attitude, actions, and/or behavior contrary to the indications given in this regard.