

MATH 5008
Counting the Possibilities - Discrete Mathematics
(RM-MSMSP)

Instructors:

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Course Meetings: Class will be held July 12th - July 14th, July 17th - July 20th
and July 24th - July 26th, from 8:30 to 3:30.

The typical daily schedule that we will try to follow will be:

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| 8:30 - 10:00 | Session 1 |
| 10:00 - 10:15 | Break |
| 10:15 - 11:45 | Session 2 |
| 11:45 - 12:45 | Lunch |
| 12:45 - 2:00 | Session 3 |
| 2:00 - 2:15 | Break |
| 2:15 - 3:30 | Session 4 |
| 3:30 - 4:30 | Assignment/Problem/Help Session |

Course Description: In a "guided discovery approach" we will explore the "Art of Counting", from basic counting techniques, graph theory, voting theory and recursion to more advanced counting involved in the analysis of games.

Attendance: is mandatory due to the intense nature of the course. Any time missed, the work will have to be made up by arranging with the instructors. More than one day missed, or excessive partial misses brings forfeiture of stipend and credit.

Credit: Four hours of College of Liberal Arts and Sciences graduate credit from the University of Colorado at Denver, will be awarded upon successful completion of the course. Registration for the course and payment of the \$300 tuition is mandatory.

Stipends: A \$1500 stipend will be awarded to RM-MSMSP partner district participants upon successful completion of the course. An additional \$1500 will be awarded to partner district participants when the corresponding Structured Follow-Up is successfully completed in Spring 2007. Only partner district participants are eligible for stipends, although registration for 3 credit hours in Education is possible for the SFU.

Assignments and Grading:

1. *Presentations* -- By the sheer size of the class, presentations will always be team participation. There will be three types of presentation:

- Historical (1) as a team on a variety of days (3 - 5 minutes) (10pts).
- Computer Excursion (2) work as a team - each member presents one of the two - on Day # 3 & 6 (less than 7 minutes) (10 pts each).
- A Lesson Plan Presentation (2) work as a team - each member presents one of the two - on Day # 5 & 9 (15 minutes)(30 pts for the presenter).
- Every team will have to hand in a one page explanation of their lesson plan (15pts each).

2. *Homework* - Will include readings, typically each night from the book and other resources, and problems to be handed in. Angela Harris will be available from 2:30 - 4:30 each afternoon to give assistance. We will go over the questions - either at the start of class, or sometimes over the course of a particular day (10 pts. each).

Achieving a 90% or more average on these graded assignments, assures an "A". A "B" if an 80% or more is achieved and a "C" if 70% or more is achieved. The instructors reserve the right to adjust grades using pluses

and minuses to reflect student participation in the course - THERE IS NO A+ or F-.

Materials & Supplies: We will provide a textbook and a bunch of other goodies. You are expected to bring writing materials and paper every day. Calculators will be useful (but not required) on several days, no other auxiliary math paraphernalia should be needed.

Innovation Project: One of the requirements for successful completion of the Structured Follow Up course is implementation of an Innovation Project. It is expected that one of the Lesson Plan Presentations will become the outline of your Innovation Project.

Final Comment: Please turn off all pagers and cell phones at the beginning of class!

Historical Topics
Discrete Math
RMMSMSP

6/23/06

Cambridge
what method.

Jack + Diane

Counting/ Probability

- ✓ • Pascal's Triangle (4)
- ✓ • Monte Hall/ Marilyn vos Savant (3)

Social Choice

- Arrow's Impossibility Theorem
- Banzhaf & the Nassau County Cambridge Ballots (6) ✓
- 1790 Apportionment (The Great Compromise)

Graph Theory

- Euler & the Bridges of Konigsberg (4) (4)
- Hamilton & the Traveling Salesman Problem/ Hamilton's Puzzle
- Four color Theorem (3)

Golden Ratio/Recursion

- Fibonacci Rabbits (3)

Game Theory

- Prisoner's Dilemma (7)
- ~~Cuban Missile Crisis~~
- Game of Life (5)

Towers of Hanoi
Mancala Buss