

**Department of Mathematics and Computer Science
St. Mary's College
St. Mary's City
Maryland 20686-3301**

Semester: Spring 2005
Course Number: MATH 200.01
Course Title: Discrete Mathematics
Prerequisites: None
Meeting Times: Mondays, Wednesdays and Fridays, 1:20pm to 2:30pm
Location: Schaefer Hall, Room 106
Instructor: Simon Read
Office Location: Schaefer Hall, Room 174
Office Hours: Mondays 2:40pm to 4:00pm and Wednesdays, 2:40pm to 4:30pm
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Class Web-Site: <http://courses.smcm.edu>

Required Textbook:

“Discrete Mathematics and Its Applications”, Kenneth H. Rosen, 5th Edition,
McGraw-Hill, 2003, ISBN 0-07-242434-6.

Catalog Description:

Set theory, elementary logic, sequences and mathematical induction, functions and relations, counting techniques, matrix theory, graphs, trees. MATH 200 satisfies the General Education Requirement in Mathematics. MATH 200 assumes more mathematical preparation than MATH 131.

Objectives:

Mathematics is often thought of as the study of real (“decimal”) numbers. While this branch of mathematics is important and interesting, there are many other branches. In this course, we will study some of these. In fact, the branches of mathematics we will be studying can be thought of as the basis of the other branches of mathematics.

This course will help you improve your problem solving skills by exercising them on mathematical problems. It will also introduce you to the concept of proof and techniques that can be used to find and construct them. Even if you never write another proof, these skills will be useful to you in constructing sound verbal arguments (rhetoric). Finally, if

you choose to study and practice computer science, this mathematics is essential to a deeper understanding of the formal foundations of that discipline.

Methods of Instruction:

Lecture and class discussion will be used to convey the informational part of the course.

In-class presentations of proofs and examples from the textbook by individuals will help to re-enforce the material and develop verbal communication and presentation skills. Students will be notified in advance of the class which proofs or examples they will present. Group work on solving problems selected from the text will help in the development of problem solving and teamwork skills.

In-class examinations and homeworks will be used to develop the use of the material in problem-solving. These will consist of problems similar to those in the textbook, and that groups have worked on in class. As with much of mathematics, the best method of studying the material more deeply is to attempt problems; a large number of which are presented in the textbook.

Interactions with the instructor outside scheduled class times will be an important part of your learning in this class. You should use the instructor's office hours as time to discuss concepts and homework problems.

Grading Criteria:

There are three elements to the grading of this class: the examinations; the homeworks and participation in classroom activities.

You will take a mid-term examination (**1 hour, weight 10%**) and a final examination (**2 hours, weight 40%**). You may prepare a crib sheet for use in the examinations.

There will be weekly homeworks based on the material studied during that week (**weight 40%**).

You will be expected to attend and participate in classes (**weight 10%**). I will be randomly selecting individuals for certain activities, and this will be used in part to assess class participation. The in-class participation grade will be in part based on peer-assessments.

Policies:

Communications

This course uses the course management software Blackboard. This system will be used to provide: announcements concerning the class; Powerpoint slides used in classes (if any); external links to useful World Wide Web resources.

Your grades will be displayed on Blackboard. **You** are responsible for making sure that this grade sheet accurately reflects the grades given for each piece of work.

Plagiarism

Students must be familiar with the "Student Code of Rights and Responsibilities", as stated on pages 81-95 in the "To The Point Student Handbook", especially Article III

Section 1. Not being familiar with your rights and responsibilities is no excuse. Any direct quotes and someone else's ideas or information **must** be referenced.

Incompletes

“An I (Incomplete) may be given by the instructor only at the request of the student when extraordinary circumstances, such as extended illness or other serious emergency beyond the control of the student, prevent the student from completing a course within the academic term. To qualify for an Incomplete, the extraordinary circumstances must have occurred near the end of the term and the student must have been attending the course regularly throughout the term up until that point.”

- Academic Policies, St. Mary's College of Maryland, Catalog 2002-2003, p. 181

Late Submission

Except for unusual, documented circumstances assignments will not be accepted late.

Examinations

Unless otherwise stated, all examinations are 'in class', 'cumulative' and 'closed book'. Calculators are allowed, but must be 'cleared' before the examination starts. Students may use a 'crib sheet' during the examination. The 'crib sheet' may be: only one sheet of paper; written or printed on both sides; no larger than US letter sized. Preparing the 'crib sheet' is a helpful part of studying for the examination.

Grading

To earn a C grade, your work must show a strong understanding of the information presented in the course. To earn a B grade your work must show a strong understanding of the information presented in the course **and** an ability to apply this information in problem solving. To earn an A grade your work must show a strong understanding of the information presented **and** an exceptional ability to apply this information in problem solving.

Written materials will be judged with respect to writing quality as well as technical accuracy. Papers are expected to meet or exceed accepted college English and scholarship standards.

Schedule:

The topics covered in classes, reading assignments, homework assignments and deadlines will be provided in-class or by email. It is your responsibility to check your email at least daily.

Date		Topic	Reading	
January	19	Introduction		
	21	Propositional Logic	§1.1-2	pp. 1-26
	24	Predicate Logic	§1.3-4	pp. 28-50
	26	Methods of Proof	§1.5	pp. 56-73
	28	Sets	§1.6-7	pp. 77-94
	31	Functions	§1.8	pp. 97-108
February	2	Algorithms	§2.1	pp. 119-129
	4	Asymptotic Notation	§2.2-3	pp. 131-150
	7	Primes and Congruence	§2.4	pp. 153-166
	9	Integer Algorithms	§2.5-6	pp. 169-194
	11	Boolean Algebra	§10.1-3	pp. 701-717
	14	Logic Minimization	§10.4	pp. 719-732
	16	Matrices	§2.7	pp. 196-204
	18	Proof Strategies	§3.1	pp. 213-223
	21	Sequences and Summations	§3.2	pp. 225-236
	23	Induction	§3.3	pp. 238-252
	25	Recursion	§3.4	pp. 256-270
	28	Recursive Algorithms	§3.5	pp. 274-283
March	2	Program Correctness	§3.6	pp. 284-289
	4	Midterm Examination (In-Class)		
	7	Counting	§4.1-2	pp. 301-318
	9	Permutations and Combinations	§4.3	pp. 320-333
	11	Discrete Probability	§5.1	pp. 335-348
	21	Expected Value	§5.3	pp. 379-392
	23	Recurrence Relations	§6.1	pp. 401-408
	25	Divide-and-Conquer Algorithm	§6.3	pp. 425-433
	28	Inclusion-Exclusion	§6.5	pp. 451-455
	30	Relations	§7.1	pp. 471-479
April	1	n -ary Relations	§7.2	pp. 482-488
	4	Representing Relations	§7.3	pp. 489-494
	6	Closures of Relations	§7.4	pp. 496-506
	8	Equivalence Relations	§7.5	pp. 507-512
	11	Partial Orderings	§7.6	pp. 516-527
	12	Graphs & Graph Terminology	§8.1-2	pp. 537-554
	13	Representation and Isomorphism	§8.3	pp. 557-563
	18	Connectivity	§8.4	pp. 567-575
	20	Euler and Hamilton Paths	§8.5	pp. 577-588
	25	Trees	§9.1	pp. 631-641
	27	Tree Applications	§9.2	pp. 644-656
	29	Tree Traversal	§9.3	pp. 660-672
May	6	Final (7:00pm – 9:15pm)		