**Math 216**          **Discrete Mathematical Structures and Proof**          **Fall 2005**
Monday, Wednesday, Friday - 8:50 to 10:00 a.m.
PPHAC 330

**Instructor:** Alicia Sevilla
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Office hours:  M W F, 10:30-11:20 a.m. and 1:30 - 2:10 p.m., Th 1-2:00 p.m., and by
appointment

**Catalog Course Description:** Elementary mathematical logic and types of mathematical
proof, including induction and combinatorial arguments.  Set theory, relations, functions,
cardinality of sets, algorithm analysis, basic number theory, recurrences and graphs. Writing
Intensive.

**Prerequisites:** Math 171 or permission of the instructor.

**Course goals:** The main purpose of this course is to provide you with the necessary skills and
background to successfully study and communicate advanced mathematics and computer
science. Mathematical writing is an essential part of the course.
Specific course goals are to:

- improve your ability to read and understand mathematical definitions and proofs;
- help you learn how to construct mathematical proofs;
- help you learn how to write mathematical proofs;
- help you learn how to communicate mathematical ideas to different audiences;
- help you learn about basic mathematical structures that are useful for further study of
  mathematics and related sciences.

**Text:** *Discrete Mathematics and Its Applications*, Kenneth Rosen, fifth edition, McGraw Hill,
2003

**Topics Covered:** We will cover most sections of chapters 1-4 and 6-8. Topics include:
propositional logic, predicates and quantifiers, nested quantifiers, method of proof, sets, set
operations, functions; algorithms, the growth of functions, complexity of algorithms, the
integers and division, modular arithmetic; proof strategy, countable and uncountable sets,
mathematical induction, recursive definitions and structural induction; the basics of counting,
the pigeonhole principle, permutations and combinations, binomial coefficients; recurrence
relations, inclusion-exclusion; relations and their properties, equivalence relations;
introduction to graph and graph terminology, representing graphs and graph isomorphism,
connectivity, Euler and Hamilton paths.

**Homework Assignments:** Daily reading and writing assignments will be given. You are
expected to complete all assignments when due and to come to class prepared to answer and
ask questions. Some assignments will be collected and graded. You should keep a folder
with all completed written (graded and ungraded) assignments. The instructor will
periodically check this folder. For ungraded written homework assignments, you are encouraged to work with a classmate if you wish, but all work to be handed in for grading must be done individually. The Academic Honesty Policy guidelines for Mathematics courses, which are attached, are to be followed. Graded assignments must be turned in on the date due to be graded without penalty. No assignment will be accepted after graded papers have been returned to the students.

**Attendance to Mathematics Colloquia:** The Mathematics and Computer Science sponsors a Mathematics Colloquium approximately once a month. These are mathematical lectures on different subjects given by a professor from Moravian or from another college. This year scheduled is not finalized yet. Details will be announced in class, as soon as they become available. You are required to attend at least two of the colloquia and write a one-page summary/reaction for each one attended. You are of course encouraged to attend every Mathematics Colloquium.

**Examinations and papers:** There will be two in-class exams, a writing project, and a final examination. The dates of the in-class exams are: **Monday October 3  Wednesday November 9**

The writing project will have several stages, and will include peer revision. Details and due dates will be announced when the project is assigned.

There will also be a final exam, which will include a writing part that will be assigned a week before the last day of classes, and will be due the date of the final exam.

**Class Attendance:** Regular attendance is required of all students. Students are responsible for all work covered in class, and all assignments, even if absent from class. If you must miss more than one class the instructor should be notified. Hourly exams must be taken at the announced time; make-up exams will be given only in the case of illness or extreme emergency.

**Help:** You are encouraged to ask questions in class and to see Dr. Sevilla for extra help when necessary. Do not wait until you are behind to seek help. It is very important to keep up with the class work. You are also encouraged to study with other students in the class. Giving and receiving explanations can be very helpful when doing non-graded homework and in preparation for exams. For hand-in assignments you may ask questions of Dr. Sevilla but should not consult anyone else.

**Grades:** Final grades will be based on homework assignments, two in-class exams, one paper, a final exam, and class participation as follows: two in-class exams 30 % (15 % each) one paper 10% homework assignments 30% class participation and attendance to colloquia 5 % final exam 25%
ACADEMIC HONESTY POLICY GUIDELINES
MATHEMATICS

The Mathematics and Computer Science Department supports and is governed by the Academic Honesty Policy of Moravian College as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thoughts of others, however, you must acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help from anyone other than your instructor or if you fail to reference your sources you will be violating the Academic Honesty Policy of Moravian College. For homework which is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.

All in-class or take-home tests and quizzes are to be completed by you alone without the aid of books, study sheets, or formula sheets unless specifically allowed by your instructor for a particular test.