Discrete Mathematics (MATH 250)  
Spring Quarter, 2007

Time/Place: MWF 12:00-12:50 p.m.  KRH 345

Instructor: Jonathan Duncan (duncjo@wwc.edu)  
Office: Kretchmar Hall 330, phone: 527-2097  
Office Hours: 9:00 MTWF, 11:00 R, 13:00 TR, or by appointment

Webpage: http://math.wwc.edu/courses/250/

This course provides an introduction to discrete mathematical structures. Topics include combinatorics, sets, recursion, and graph theory. We will cover selected sections from various chapters of your text, in order. The deadline for withdrawing from the course is Tuesday, 15 May and the final will be on Monday, 4 June 2007.

Topics

1. Logic, Sets, and Functions (Chapters 1 & 2):  
   propositional logic, propositional equivalences, predicates and quantifiers, nested quantifiers, rules of inference, introduction to proof, sets, set operations, functions, sequences and series

2. Mathematical Reasoning and Counting (Chapters 4, 5, & 7):  
   mathematical induction, strong induction, the well ordering principle, recursive definitions, basic counting, pigeonhole principle, permutations and combinations, recurrence relations, solving linear recurrence relations, generating functions, inclusion-exclusion

3. Relations, Graphs, and Trees (Chapters 8, 9, & 10):  
   relations, n-ary relations, representing relations, closures of relations, equivalence relations, graphs and graph models, graph terminology, graph isomorphism, connectivity, Euler and Hamilton paths, trees, tree traversal, spanning trees

Objectives

Upon completion of this course, students will have

1. developed demonstrable understanding of the topics outlined above.
2. successfully engaged in mathematical reasoning and proof, both formally and informally.
3. effectively communicated ideas and solve problems from the topics outlined above.

The following requirements encourage and measure the successful completion of these objectives.

Homework (O2,03)

Mathematics is not a spectator sport. Daily assignments will be given, each due by 5:00 p.m. on the day of the next class period. These assignments should be considered the minimal amount of homework required to pass the course, and can be expected to take approximately two hours for each hour of lecture. Assignments which are more than one class day late will not be accepted. Your lowest two homework scores will be dropped at the end of the quarter. If you miss more than two assignments due to appropriate and verifiable reasons, additional homework scores may, at the discretion of your instructor, be dropped.
Please observe the following guidelines when preparing your homework. Papers which do not meet these criteria may be discounted or returned.

1. Use letter (8.5 × 11) sized paper with clean edges (not torn out of a notebook).
2. Multi-page assignments must be stapled or paper-clipped together.
3. Fold the assignment lengthwise like a book and write your name, the course number, and assignment number(s) on the front cover.
4. Use a pencil, write legibly, and organize your problems and solutions in a logical manner.

Exams (O1, O2)

There will be four exams during the course of the quarter, including the two-hour comprehensive final. The first three exam dates are subject to in-class change, announced at least one week in advance. You may request alternative exam dates in advance for appropriate and verifiable reasons. The final exam may only be taken out of schedule after consultation with the Associate Academic Dean.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Chapters</th>
<th>Date</th>
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<tbody>
<tr>
<td>I</td>
<td>1 and 2</td>
<td>13 April</td>
</tr>
<tr>
<td>II</td>
<td>4, 5, and 7</td>
<td>4 May</td>
</tr>
<tr>
<td>III</td>
<td>8 and 9</td>
<td>25 May</td>
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<tr>
<td>Final</td>
<td>Comprehensive, emphasis on 10</td>
<td>Mon, 4 June 2:00 p.m.</td>
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Solution Write-up (O3)

When writing exams and homework solutions there are several things you should keep in mind. First, a solution is not simply an answer. A solution is a guide to understanding why the answer you give is correct. As such, it is not enough to supply a number or a formula. **You must show your work!** Second, your solution must communicate how you arrived at your answer. To help facilitate this communication, you should include short sentences along the way, explaining what you are doing to solve the problem. This will also help prompt you in case you forget what the next step in a particular solution should be. Finally, presentation is an important part of any communication. You are trying to “sell” your work to the reader. Make your solution neat and legible. It should flow nicely and be a joy to read!

Grades

Your final letter grade will be based on your quarter average as shown below. Your quarter average is made up of five scores: your homework average and four exam scores. Weights for each of these are given below. Appropriate (to your instructor) modifications of the final letter grades may be made in individual cases for progress, unusual circumstances, etc.

<table>
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<tr>
<th>Score Weights</th>
<th>Letter Grades (lowest percent)</th>
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<tr>
<td>Final 30%</td>
<td>B+ 89% C+ 78% D+ 64%</td>
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<tr>
<td>Exams I-III 3×18%</td>
<td>A 93% B 82% C 68% D 57% F 0%</td>
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<tr>
<td>Homework 16%</td>
<td>A- 91% B- 80% C- 66% D- 55%</td>
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All acts of dishonesty are unacceptable, including cheating, plagiarism, forgery, misrepresentation, falsification, and prohibited collaboration. Violation of academic integrity codes will result in disciplinary action. Collaboration on homework is encouraged, but be certain that the work you hand in is your own.

Disabilities

Students with a physical and/or learning disability who require accommodations should contact the instructor or Disability Support Services at 527-2366. This syllabus is available in alternative formats upon request.