Math 3000
Introduction to Abstract Mathematics
Summer 2010

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Department Web Address: www-math.cudenver.edu

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Fax: 303-556-8550

1. Time and Location:  
Tuesday and Thursday 1:15 - 3:45pm in PL 114, June 8 - July 29

2. Prerequisites:  
- Calculus I  
- Calculus II (strongly recommended)  
- Maturity to learn independently.

3. Course Description:  
Students learn to prove and critique proofs of theorems by studying elementary topics in abstract mathematics, including logic, sets, functions, equivalence relations and elementary combinatorics.

4. Textbook:  
Mathematical Proofs: A Transition to Advanced Mathematics, 2/E. Gary Chartrand, Albert D. Polimeni, Ping Zhang. ISBN-10: 0321390539. We plan to cover chapters 1 - 10 (students are responsible for reading chapter 0). Students must bring their text to class every day.

5. Course Goals  
- To learn to develop rigorous mathematical arguments  
- To learn to read and write mathematical proofs.  
- To strengthen and deepen knowledge and understanding of abstract mathematics and proofs.  
- To strengthen the ability to communicate clearly about mathematics; both orally and in writing.  
- To promote the exploration and explanation of mathematical phenomena both individually and in teams.  
- To prepare students for higher level (proof based) courses in mathematics and science.

6. The Daily Routine:  
- Math is not a spectator sport! We will ALL learn by doing, discussing, listening, arguing, and teaching in this class.  
- You are required to read ahead in the text before the next class. Problems from the assigned section(s) should be “sketched” in your notebook. Selected problems will be used for discussion purposes during the next class.  
- The first portion of the class is dedicated to discussing problems that were assigned for the day. Students may be asked to present these problems to their study teams or to the class as a whole.
• The second portion of the class is dedicated to study teams working together with the instructor to solve problems that are (generally) more complicated than the homework activities. This time will also be used to introduce new material as needed.

• The instructor will play the role of facilitator to discussions that occur during class. The instructor will only occasionally lead the class in a lecture.

7. Study Teams:
• Each student will be required to work with other students in a study team. This team is to share in the tasks of learning, discovering, experimenting, and presenting.

• Students must trust each other’s knowledge and realize that the instructor is not the only one in the class that has any knowledge.

• The instructor’s role is to facilitate group and class discussions, clear up team’s misconceptions, and to bring deeper understanding to course material.

• Study teams are meant to supported each student’s growth toward being a confident, independent learner empowered with the help of peers to be able to make sense of the world of abstract mathematics.

• Students should select their study team such that the members of their team have similar goals, similar schedules, and similar learning styles.

• A successful study team will realize that it is important and helpful to learn multiple approaches when solving problems. Students in a study team must learn to value one another’s opinion. Through this, individual learning results from the group process.

8. Attendance:
Attendance is absolutely essential since we will be working in groups and discussing problems during class. You are permitted one absence from this class with no penalty. After that each missed day will result in a 2% penalty in your final grade. Regularly showing up late is not acceptable and may result in a grade penalty being assessed.

9. Exams and Grading Policies:
Exams:
• There will be one in-class exams and a comprehensive final exam. The in-class exam will be weighted 25% and the final exam will be weighted 30%.

• Review material will be provided in the form an itemized list of topics and suggested review problems. If you are looking for good test questions check out any of the problems that we have done along with any odd numbered problem from the text.

• No technology will be allowed on the tests unless otherwise specified.

• Expect to memorize most definitions.

• There are severe consequences for not contacting me prior to test time if you cannot take the tests at the appointed time! You must contact me FAR in advance!

Quizzes:
There will be a "definitions quiz" each week. These are tentatively planned for Thursdays but the schedule will remain flexible.

Homework: Homework will be handled in two formats.

(a) You will be asked to read ahead to sections that are upcoming in the course. In these sections, you will be asked to “sketch” problems into your notebook. You should be prepared to discuss and possibly present each of these problems the following class period. Questions from these problems will drive the discussion the next day.

(b) Each week you will have a homework quiz that asks you to do 1 - 3 problems similar to the homework problems. These quizzes will be open note.

Rubric for Proofs:
Proofs and in-class presentations will be graded on the following rubric.
<table>
<thead>
<tr>
<th>Rubric Score</th>
<th>Description</th>
<th>Percentage Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Perfect proof that goes above and beyond in some way</td>
<td>110</td>
</tr>
<tr>
<td>4.5</td>
<td>Perfect proof</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Fully correct or at most an extremely minor error</td>
<td>95</td>
</tr>
<tr>
<td>3.5</td>
<td>Correct with a minor error</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>Mostly correct, good, solid work, minor error(s) only</td>
<td>85</td>
</tr>
<tr>
<td>2.5</td>
<td>C work. Details missing and not completely correct</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>Weaker work, some progress, major error</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td>Minimal progress</td>
<td>10</td>
</tr>
<tr>
<td>0</td>
<td>Not submitted, left blank, or clearly plagiarized</td>
<td>0</td>
</tr>
</tbody>
</table>

I am available via email for homework help. I usually email back quickly, but sometimes it can be as much as 48 hours. Please don’t expect email responses past 11:00pm or within 3 or 4 hours of a due-date. I may not have my book with me when I answer my email so please include a description of the problem in your email.

**Extra Credit:**
No extra credit will be offered.

10. **Percentages and Letter Grades**:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Quizzes</td>
<td>25 %</td>
</tr>
<tr>
<td>Presentations / Discussion / Participation</td>
<td>10 %</td>
</tr>
<tr>
<td>Weekly Quizzes</td>
<td>10 %</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>25 %</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30 %</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93.00 - 100</td>
</tr>
<tr>
<td>A-</td>
<td>90.00 - 92.99</td>
</tr>
<tr>
<td>B+</td>
<td>87.00 - 89.99</td>
</tr>
<tr>
<td>B</td>
<td>83.00 - 86.99</td>
</tr>
<tr>
<td>B-</td>
<td>80.00 - 82.99</td>
</tr>
<tr>
<td>C+</td>
<td>77.00 - 79.99</td>
</tr>
<tr>
<td>C</td>
<td>70.00 - 76.99</td>
</tr>
<tr>
<td>D</td>
<td>60.00 - 69.99</td>
</tr>
<tr>
<td>F</td>
<td>≤ 59.99</td>
</tr>
</tbody>
</table>

11. **Academic Honesty**

(a) I HAVE NO TOLERANCE FOR CHEATING! Cheating of any kind on a quiz, test, or even homework will result in a course grade of “F”. It is possible that you will also be expelled from the University.

(b) It is OK to collaborate on homework, but if there is compelling evidence that you are simply *copying* homework solutions from a solutions manual or from another student, then you will receive a failing grade for that assignment. Repeated offenses may result in a course grade of “F” and possible expulsion.

(c) **CELL PHONES CAN BE USED FOR CHEATING. THEREFORE, IF IT GOES OFF DURING AN ASSESSMENT YOU WILL AUTOMATICALLY RECEIVE AN “F” ON THAT ASSESSMENT. TURN THEM OFF!!**

12. **How much time should I be spending on this class each week?**

A “full-time job” is considered to be 40 hours per week and a “full-time student” is considered to have a schedule of 15 credit hours per week. If you subtract 15 hours of class time from the 40 hours, that leaves 25 hours of studying per week. This is a three credit-hour class, so (3/15) of 25 hours amounts to 5 hours of studying, outside of class time, per week. This is a summer course, so double this to make a **minimum** of
10 hours outside of class per week. Consider this the absolute minimum amount of time that you should be spending per week. In reality you should spend up to 20 hours per week on this class.

13. **Assistance:**
   If you are stuck on a problem for more than an hour you should start by contacting your study team members. If your teammates cannot help then contact me via email and we will discuss the problem. In addition to office hours, there are several places to seek help with this course. The lab assistants in the MERC Lab (NC 4015) are available to help you.

   There is an on-line tutoring service available to all UCD mathematics students. It can be accessed at www.math.cudenver.edu and select On-Line Mathematics Tutoring. The tutors are from CSU, CU-Boulder, and CU-Denver and are available at varying times, with a spring schedule to come soon.

14. **Student Code of Conduct**
   As members of the University community, students are expected to uphold university standards, which include abiding by state civil and criminal laws and all University policies and standards of conduct. These standards are outlined in the student code of conduct which can be found at:
   http://thunder1.cudenver.edu/studentlife/studentlife/introduction.html

15. **Drops and Incompletes:**
   An incomplete grade “I” is not granted for low academic performance. To be eligible for an incomplete grade, students must (1) successfully complete 75% of the course, (2) have special circumstances (verification may be required) that preclude the student from attending class and completing graded assignments, and (3) make arrangements to complete missing assignments with the original instructor using a CLAS Course Completion agreement. An “I” will convert to an “F” at the end of one year if the coursework has not been completed.

16. **Religious Holiday Accomodations:**
   You must inform me at the beginning of the semester in order for me to accommodate any rescheduling of your coursework.

17. **Disability Accomodations:**
   To be eligible for accomodations, students must be registered with the UCDHSC Office of Disability Resources and Services (DRS). The office is located in NC 2514 (303-556-3450). Faculty cannot arbitrarily decide to give a student extra time, extra assistance, or other forms of aid unless it is formally mandated by the DRS.