I. COURSE INFORMATION
Meeting: TR 8:00-9:15 am CS 114
Professor: Dr. Jose H. Giraldo
Office Phone: X 5827
Office Address: CI 317
E-mail address: jose.giraldo@tamucc.edu
Class Web Address: http://sci.tamucc.edu/~jgiraldo/foundations/
Office Hours: TR 11:00 am -12:00- 12:30-2:00 pm
Others by appointment

II. COURSE DESCRIPTION
This course assists students in the transition from lower level courses, such as calculus, to higher-level courses, such as advanced calculus and modern algebra. While lower-level mathematics emphasizes skills and techniques needed for courses outside mathematics, higher-level mathematics courses require students to understand and write proofs and to think more abstractly. This course introduces students to fundamental ideas in logic and set theory needed for courses in higher mathematics and for secondary school and collegiate teaching. Techniques of proof, such as proof by contradiction and proof by induction, are used in various settings such as analytic geometry and coordinate systems. The proper use of quantifiers, multiple quantified statements, properties of functions and relations on sets, modular arithmetic and equivalence relations, and partial ordering are emphasized. Examples used in this course will be taken from number theory, combinatorics, graph theory, modern algebra, and advanced calculus.

III. PREREQUISITES
Math 2414: Calculus II and Math 2305: Discrete Mathematics

IV. TEXT AND OTHER SUPPLIES

V. STUDENTS LEARNING OUTCOMES
Students completing this course will:
- Understand the structure and properties of real and complex number systems,
- Read and understand arguments involving set theory and logic with minimal assistance from the instructor,
- Generalize mathematical observations of special cases,
- Write proofs of basic results in advanced calculus and set theory, which include multiple quantified statements,
- Present mathematically precise arguments to peers, beginning college students, and secondary school teachers,
- Develop reasoning skills needed in higher mathematics course work and mathematics teaching.
VI. INSTRUCTIONAL METHODS AND ACTIVITIES

The best way to learn how to prove mathematical results is by doing it as opposed to watch somebody else do it. I expect you to be an active participant in this class. I will guide the process but you, the student, will be the main player. Our objective is to discuss the first five chapters of the book.

The class period will be divided in sections:

- I will write on the board the numbering for two or three problems I want you to present.
- Discussion of any homework problems in pairs or groups of up to three students (10 minutes)
- Presentation of the three assigned problems (15 minutes)
- Discussion of new topics (45 minutes)

VII. EVALUATION AND GRADE ASSIGNMENT

Your final grade will be determined according to these percentages:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
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<tr>
<td>Special Problems</td>
<td>20%</td>
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<tr>
<td>Tests</td>
<td>40%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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HOMEWORK

Your homework will be assessed based on the daily presentation of homework problems. At the beginning of each class I will announce which homework problems to be discussed. You can volunteer to present any of those problems. However, before you volunteer to present a new homework problem, your classmates should have presented as well. This way, by the end of the semester all the students should have presented the same number of problems. It is important that you explain ideas in a clear manner.

Special problems

Out of the list of special problems you choose two to present to the class. We will make sure you don't present the second problem before the rest of your classmates have presented the first one. This is the process to follow for these problems:

1. Visit with me to discuss your solution, or progress toward the solution of the problem.
2. You are not allowed to take notes while you are in my office.
3. You need to discuss with me your final solution to the problem and its write up.
4. Explanation of the problem to the rest of the class.

The solution(s) has (have) to be original, it is, you can not get help from any source (book, peers, web, etc). Parts 1-3 will be worth 5 points and part 4 will be worth 5 points.

- 4.5-5 Excellent
- 4.5 - Very Good
- 3.5 - Good
- 3 - Average
- 0 - Below average

Remember that we will be looking at the way you reason to find/justify mathematical claims. It may take you more than one attempt to solve a problem. So, concentrate on the process.

Students are expected to read the book before class and be prepared for any class discussion. The class period will be used to discuss problems and clarify concepts. The amount of lecturing from the professor will be minimal. You will learn by doing it.

Information about the content for the tests and the final exam will be available through the web page of the course.

**VIII TENTATIVE COURSE SCHEDULE**

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<tr>
<th>WEEK</th>
<th>TOPIC</th>
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<tr>
<td>1</td>
<td>1.1, 12</td>
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<td>2</td>
<td>1.3-1.5</td>
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<td>3</td>
<td>1.6-1.7</td>
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<td>4</td>
<td>2.1-2.2</td>
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<td>13</td>
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<td>5.3, 5.4</td>
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<td>15</td>
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**IX CLASS POLICIES**

- The course requires a solid and continuous effort. Since this is a three-credit course, you are expected to devote for each hour of class between two and three hours outside the class working on the subject. Some people need more time than others. Each individual has a different way to learn. All of us are different.
- I do expect that you come to each class prepare to talk about any assigned work and readings. One of the best ways to learn any subject and specially mathematics is by talking to others about a problem after you have read and attempted the problems on you own. Listening to a solution without attempting to solve it and struggling through the process will not benefit you very much. *Be aware that being able to read solutions to problems and follow the explanation does not*
mean that you know how to do the problem and understand all what is involved in the solution process.

- At the beginning of each class you have the opportunity to ask questions about the homework. Use that time wisely. Remember that making a serious attempt to solve a problem and later discuss your solution or to clarify doubts is key in the learning process.

- Feel absolutely free to ask any questions. Your question will benefit you and most likely others around you. One of the driving forces of mathematics is the questioning part. Why? Why? Why? Rote memorization is not a great help here but is needed too at some point.

- Do not hesitate to contact me in case you want to discuss your performance in the class. I am here to lead your learning but you are the one responsible for it. I AM A COACH, YOU ARE THE PLAYER.

- After you receive your grades you have up to the next class meeting to dispute it. I am the only person you can dispute your grade with. After the two days I assume that you accepted your grade. NO EXCEPTIONS. Grades are posted on the web immediately after I return a graded paper.

- You are expected to be on time for class. Arriving late or leaving the classroom before the end of the period will be considered impolite, and rude to your classmates and professor. BE ON TIME FOR EACH MEETING. Your attendance will be monitored. The attendance sheet will be in the front of the classroom for each meeting. Make sure you check it on daily basis.

- If at any point in the semester you are considering to drop the class, talk to me before you do it. I am here to help you in your learning experience and to help you to succeed in your college career.

- Do not be late in the work you have to turn in. For any work to be collected this is the policy on tardiness: For your late work to be accepted you need to present an excuse to the professor. If the professor accepts to take the work, it will be graded over 80% of the initial grade. Work ahead of schedule. Do not wait for last minute surprises.

- The most basic rule to work as part of a group is to respect others. I will appreciate all your effort to make it the golden rule. Refer to others with respect.

- You are always on your honor.

- Cell phones off please!!

**X. DROPPING A CLASS**

I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. is the last day to drop a class with an automatic grade of “W” this term.

**XI. ACADEMIC HONESTY**
**Academic Honesty:** university students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, forgery or plagiarism.

**XII. DISABILITY SERVICES**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Disability Services Office at (361) 825-5816 or go to the office at Driftwood 101.

**XIII. GRADE APPEALS PROCESS**

As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

**LIABILITY STATEMENT**

A student is responsible and has to abide by any information given in class and through the web page of the course. It may include changes on dates for tests, format of the test, and so on. Hence, if you miss class, make sure you get the information from somebody else or from the web page.

*Notice to Students with Disabilities*

Texas A&M University-Corpus Christi complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. If you suspect that you may have a disability (physical impairment, learning disability, psychiatric disability, etc.), please contact the Services for Students with Disabilities Office, located in Driftwood 101, at 825-5816. If you need disability accommodations in this class, please see me as soon as possible.

**ACADEMIC ADVISING**
The College of Science and Technology requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. The College's Academic Advising Center is located in Faculty Center 178, and can be reached at 825-6094.