Spring Semester 2010-2011  
MATH 3243: Advanced Calculus  
MW, 5:30 PM-6:45 PM, Room: Boyd Building 302  

We will cover Chapters 3-7.  

Instructor: Dr. Vu Kim Tuan  
Office: Boyd Building 325  
Phone: 678-839-4135  
E-mail: vu@westga.edu  

Lecture Hours: MW 5:30 PM-6:45 PM  
Office Hours: MW 4 PM-5:30 PM, or by appointment.  

Course Description: This course is a rigorous introduction to the fundamental concepts of single-variable calculus. Topics include the real numbers, limits, continuity, uniform continuity, differentiation, integration, sequences and series. As a WAC offering, emphasis will be placed on writing as an integral part of the learning process.  

Learning Outcomes: the student will be able:  
-To understand the concept of completeness of the system of real numbers: a least upper bound, a greatest lower bound.  
-To understand the concept of topology of the real numbers: open sets, close sets, accumulation points, closure, open cover, compact sets.  
-To understand the concept of convergence, and to use the notion of epsilon-delta correctly.  
-To understand the concept of sequences and subsequences, monotone sequences and Cauchy sequences.  
-To understand the concept of one-sided limits, continuity and uniformly continuity.  
-To understand the concept of derivative, l’Hospital’s rule, Taylor’s formula.  
-To understand the concept of upper sum, lower sum, Riemann integrability.  
-To prove main theorems of analysis of the real line: Heine-Borel theorem, Bolzano-Weierstrass theorem, Nested Interval theorem, Monotone Convergence theorem, Cauchy Convergence Criterion, Intermediate Value theorem, Chain Rule, Rolle’s theorem, Mean Value Theorem for Derivatives, Cauchy Mean Value theorem, l’Hospital’s rule, Taylor’s theorem, Fundamental Theorems of Calculus.  

Tests and Final Exam: There will be two in-class tests and two take-home tests worth 100 points each. Take-home tests are supposed to be completed *individually*. The lowest of these test scores will be dropped. You can miss at most one test, and that test will be considered to be the test with the lowest score to be dropped. The final is comprehensive and counts 180 points.  

Important Dates: 2/7 : Test 1 (In-class)  
2/28 : Test 2 (Take-home) Due 3/2  
3/28 : Test 3 (In-class)  
4/18 : Test 4 (Take-home) Due 4/20  
Final: May 2, 5:30 PM – 6:45 PM  

No class on January 17 (Martin Luther King Holiday), March 7, 9 (Spring Break).  

Homework: The following is the list of homework  
11.1, 11.2, 11.4, 11.8, 11.9, 11.10, 11.11  
12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.8, 12.9, 12.10, 12.11, 12.13  
These are the minimum that you should work on. These problems in general will not be graded (for exception see Bonus Points Section). Some of these problems will be gone over in the class and some will be included into the in-class tests. Practice is important. I encourage you to use my office hours if you have any questions about them. You should make sure to set aside some time every class day to work problems.

**Bonus Points:** Maximum 20 bonus points will be awarded to homework solutions. The catch is that if you want your solution to be graded, you have to submit the solution to an exercise in Section X before a lecture on Section X starts. You may pick up any problem from the above list. Each correct solution gets two points. No bonus point is awarded to a partial solution. If the solution is wrong, you will get -1 point.

**Writing Project:** As a part of WAC requirement you are required to write a proof of the Bolzano-Weierstrass Theorem using Nested Interval Property (20 points).

**Grading:** The final letter grade will be determined by the following scale:

- A = 450-520
- B = 400-<450
- C = 350-<400
- D = 300-<350
- F = below 300

**W Deadline:** March 2nd is the last day to withdraw with grade W

**Disabilities:** Students with documented disabilities (through West Georgia’s Disability Services) will be given all reasonable accommodations. Students must take the responsibility to make their disability known and request academic adjustments or auxiliary aids. Adjustments needed in relation to test-taking must be brought to the instructor's attention well in advance of the test (at least one week prior).

**Attendance Policy:** You are expected to attend every class. Although absences are not penalized, if a class is missed, you are responsible for all material and assignments.

**Academic Honesty:** You are expected to achieve and maintain the highest standards of academic honesty and excellence as described in the Undergraduate Catalog. In short, be responsible and do your own work.