Course Syllabus – Spring 2019

COURSE: MATH 451 – Real Analysis – Directed Study
INSTRUCTOR: Jim Anthony
OFFICE: 158 Hoyt
OFFICE HOURS: M 9:20 – W/F 1 – 2 pm
PHONE: 724-946-7285
CONTACT: E-mail: anthonj@westminster.edu
BOOK: Analysis With an Introduction to Proof, 5th edition (Author: Seven Lay)

GRADING

Homework: (50 %) Homework will typically be due on most Thursdays. At the end of the semester, your scores will be used to generate a homework score that will account for 50% of your overall course grade.

Mid-Term: (25 %) There is one required exam given approximately the middle of the course.

Final: (25 %) There will be a required comprehensive final exam to be given during finals week.

Late homework or problem sets will NOT be accepted.
Make-up exams will be possible with permission of the Dean.
Make-up exams may be more difficult than the original exam.
Class participation/contribution and attendance may be used to determine borderline cases.

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<tr>
<th>Grade</th>
<th>Min Score</th>
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<tbody>
<tr>
<td>A</td>
<td>93.3</td>
<td>C+</td>
<td>76.6</td>
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<tr>
<td>A -</td>
<td>90.0</td>
<td>C</td>
<td>70.0</td>
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<tr>
<td>B+</td>
<td>86.6</td>
<td>D</td>
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<tr>
<td>B</td>
<td>83.3</td>
<td>F</td>
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<tr>
<td>B -</td>
<td>80.0</td>
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These cutoffs may be lowered and there may be chances for extra-credit during the course.

All information in this outline is subject to change at the discretion of the instructor.
ATTENDANCE

Attendance is required. Math is difficult to learn at times as the new material builds on the previous material. If you miss a class, it is crucial to learn the material as soon as possible. Please let me know prior to missing a class. If there is an emergency and you need to miss class, please notify me as soon as possible afterwards.

Goals:

- To gain an understanding of the analytic properties of real functions and sequences.
- To gain an understanding of the real number system.
- To gain an understanding of limits, continuity, differentiation, integration, sequences, and series.

Course Topics:

- Set Theory
- Real Number System
- Limits and Continuity
- Differentiation and Integration
- Sequences and Series

Course Objectives:

Students should be able to:

- Demonstrate an understanding of sets
- Compute, and utilize, the concepts of intersections, unions, complements, and indexed families of sets
- Prove theorems and produce counterexamples to demonstrate their understanding of functions and relations
- Use the theorems and definitions to solve problems in real analysis
- Utilize mathematical induction to prove theorems
- Determine what mathematical properties sets have through their understanding of topology and the real number system
- Demonstrate their understanding of sequences and series
- Illustrate the concepts of limits and continuity
- Show how to prove calculus theorems involving differentiation and integration
- Prove theorems and produce counterexamples dealing with limits, continuity, differentiation, integration, sequences, and series
ASSIGNED WORK IS NOT ACCEPTED LATE unless the delay is due to a verified emergency, crisis, or death, in which case a note from the Dean of Student Affairs will be forthcoming. Absence from class is not a reason for submitting late work.

HOMEWORK ASSIGNMENTS are to be submitted on Thursday at the beginning of class on the week following when the assignment was made.

ACADEMIC INTEGRITY: Central to the purpose and pursuit of any academic community is academic integrity. All members of the Westminster community, including students, faculty, staff, and administrators, are expected to maintain the highest standards of honesty and integrity, in keeping with the philosophy and mission of the College. Academic dishonesty is a profound violation of this code of behavior.

This academic integrity statement is taken from the Westminster College Undergraduate Catalog. It is imperative that you never submit the work of others as though it is your own work nor should you ever allow anyone else to use your work without giving credit to you. The penalty for academic dishonesty in this class is minimally the grade of 0 on the assignment and possibly a grade of F for the course. Any event of academic dishonesty is reported to the Dean of the College. Other details of violations and consequences are given in the catalog.

GROUP WORK: Group work is a proper and effective way to study and learn if all participants do their full share of the work. It is possible to misunderstand exactly what it means to be responsible for “doing your own work.” You may (and should) discuss problems with other students and reach conclusions together. However, it is a form of academic dishonesty for a student, who has not attended class, read the assignment, or thought about the problem on their own to try to use the ideas developed by a group or claim credit for work to which one has not contributed. It is also dishonest to encourage or allow such practices on the part of others. You must, in all cases, leave the group discussion and write your own solutions for the exercises you submit for grading.

ACCESSIBILITY STATEMENT:
Westminster College actively strives for the full inclusion of all our students. Students with disabilities who require access solutions for environmental or curricular barriers should contact Faith Craig, Director of Disability Resources, located in 209 Thompson-Clark Hall. phone: 724-946-7192 e-mail: craigfa@westminster.edu

CATALOG DESCRIPTION:
MTH 451 Real Analysis (4 SH). A study of the analytic properties of real functions and sequences. Topics include set theory, the real number system, limits, continuous functions, differentiation, Riemann integration, sequences, and series. Prerequisite: MTH 361. (Offered Fall semester.)