Course Syllabus – Spring 2018

COURSE: MATH 312 – Fractals

INSTRUCTOR: Jim Anthony

OFFICE: 158 Hoyt

OFFICE HOURS: MWF 11:45 am – 12:45 pm

PHONE: x7285

WEB-PAGES: www.westminster.edu/staff/anthonj/

E-MAIL: anthonj@westminster.edu

BOOK: Fractals Everywhere, 3rd edition, Barnsley

GRADING 500 total points

Tests: There will be one 100-point mid-term exam.

Quizzes / Problem Sets: The quizzes/homework/problem sets/projects/presentation will be used to generate a score out of 200 points.

Final: There will be a required comprehensive final exam to be given on Monday, May 7 from 8 – 10:30 am. The final exam will count as 200 points.

There are NO makeup quizzes and 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.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Min Score</th>
<th>Grade</th>
<th>Min Score</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>93.3</td>
<td>C+</td>
<td>76.6</td>
</tr>
<tr>
<td>A -</td>
<td>90.0</td>
<td>C</td>
<td>70.0</td>
</tr>
<tr>
<td>B+</td>
<td>86.6</td>
<td>D</td>
<td>60.0</td>
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<tr>
<td>B</td>
<td>83.3</td>
<td>F</td>
<td>0.0</td>
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<tr>
<td>B -</td>
<td>80.0</td>
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These cutoffs may be lowered and there will be chances for extra-credit during the course.

EXTRA-CREDIT

There may be optional extra-credit opportunities throughout the semester. Students with poor attendance (2 or more unexcused absences) or observed cell-phone use (or any other electronic device) twice during class will not receive any extra-credit in the course.
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.

Each unexcused absence will lower your final grade percentage by ONE percent.

Perfect attendance will raise your final grade percentage by TWO percent.

Course Objectives:
Students should be able to
- Generate Fractals using multiple methods including
  - MRCP
  - IFS
  - Chaos Game
  - L-Systems
  - Escape Time Fractals
  - Flame Fractals
- Explain how fractals appear in nature
- Construct fractals to mimic “natural” fractals
- Measure the complexity of fractals
- Identify the fractal structure of images
- Demonstrate the relationship of the underlying mathematics to the fractals
- Apply fractals to model real-world situations
- Other topics as time allows.

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.

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

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, except for unusual circumstances, 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 310-319 Special Topics in Mathematics (4 SH). This elective course will investigate an area of mathematics outside of the core mathematics curriculum. A description of the topic will be distributed prior to registration. Prerequisite: MTH 241.