MATH 5329-001 Structure of Modeling with Rates of Change
Fall 2014 Syllabus

Call Number (CRN) 32964
Meeting Time: T 7:00PM – 9:30PM  Meeting Place: IH-158

Instructor: Valentina Postelnicu
Office: CI 357
Office hours: Tuesday 2:15PM-5:00PM,
Thursday 9:45AM-12:00PM, and by appointment
Phone: (361) 825-3023 (office)
(480) 220-4961 (cell, for texts and emergency only)
Email: valentina.postelnicu@tamucc.edu

Prerequisites
Graduate status

Course Description
A study of rates of change through modeling. Direct applications of rates of change to
number concepts, algebra, geometry, probability, and statistics.

Student Learning Outcomes
Upon successful completion, students in this class will be able to:
1. Representations: Move flexibly among graphical, numerical, and theoretical methods
   for analyzing data in mathematical contexts.
2. Types of Growth: Recognize and be able to work with linear, quadratic, and
   exponential growth of data presented graphically, numerically and theoretically.
3. Discrete Modeling: Recognize and be able to work with discrete-time models through
difference equations, recursive relationships, and explicit formulas.
4. Continuous Modeling: Interpret and describe continuous-time mathematical models
   through derivatives, differential equations, and stability criterion for equilibria.
5. Model Scope: Communicate limitations of data as well as the assumptions and
   predictions of mathematical models.
6. Application: Independently explore an application of modeling and relate it to the
   secondary mathematics classroom.

Instructional Methods and Activities
The course will be a combination of instructional presentation of new material and
concepts, whole-class discussion, individual investigations of mathematics, and optional
one-on-one discussion time between students and the instructor outside of class. Students
will be required to give individual or group presentations. If needed, there will be
alternative assignments in lieu of presentations. All participants are expected to engage
in group and whole class activities by contributing knowledge and thoughtful evaluation
of others’ contributions.
**Textbook**

**Other readings and course materials**
Other readings will be provided by the instructor
Graphing calculator (recommended TI 84 or TI 84 Plus)
Regular access to high speed internet and office applications (e.g., MS Word, Excel)

**Grades:** Grades will be based on the percentage of total points the student earns. There will be points given on homework, participation, midterm exam, and final exam (written paper and presentation).

**POINTS**
*Final Exam 400 points* (written paper 300 points, and presentation 100 points)
*Midterm exam 200 points*
*Homework assignments 250 points total*
*Participation 150 points*
*TOTAL 1000 points*

Final grades will be assigned according to the following table:

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Grade</th>
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<tbody>
<tr>
<td>≥90.0%</td>
<td>A</td>
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<tr>
<td>≥80.0%</td>
<td>B</td>
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<tr>
<td>≥70.0%</td>
<td>C</td>
</tr>
<tr>
<td>≥60.0%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
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</tbody>
</table>

**Attendance/Tardiness/Participation**
You are expected to attend every class session, arrive on time, and participate in class activities. There will be many opportunities for hands-on practice, individually, in group, and as a class.

**Homework and Other Assignments**
Late assignments will not be accepted, unless exceptional circumstances prevent you from completing them. Extension of deadlines will be at the instructor’s discretion. Late assignments may result in partial or total loss of credit. There are **NO** make-ups for exams. Exceptional circumstances (e.g., documented illness, family situations) may be considered at the instructor’s discretion.

**Academic Integrity/Plagiarism**
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, falsification, forgery, complicity or
plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in partial or total loss of credit.

**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. November 7, 2014 is the last day to drop a class with an automatic grade of “W” this term.

**Classroom/Professional Behavior**
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

**Grade Appeals (College of Science and Engineering Version)**
As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, 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 Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage (http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**Disabilities Accommodation**
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 for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall 116.
If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Statement of Academic Continuity
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

Course Outline (Tentative, see Blackboard for updates/changes)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Comments</th>
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<tbody>
<tr>
<td>9/2</td>
<td>Introduction to mathematical modeling</td>
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<tr>
<td>9/9</td>
<td>Linear models</td>
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<tr>
<td>9/16</td>
<td>Quadratic models</td>
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<tr>
<td>9/23</td>
<td>Polynomial models</td>
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<tr>
<td>9/30</td>
<td>Exponential models</td>
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<tr>
<td>10/7</td>
<td>Discrete models – part 1, and Midterm Exam</td>
<td>Midterm Exam 10/7/14</td>
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<td>10/14</td>
<td>Discrete models – part 2</td>
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<td>10/21</td>
<td>Continuous vs discrete models</td>
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<td>10/28</td>
<td>Applications in Statistics and Probabilities</td>
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<td>11/4</td>
<td>Applications in Geometry</td>
<td>First draft of the written paper due</td>
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<tr>
<td>11/11</td>
<td>Student Presentations</td>
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<td>11/18</td>
<td>Student Presentations</td>
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<td>11/25</td>
<td>Student Presentations</td>
<td>Second draft of the written paper due</td>
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<tr>
<td>12/2</td>
<td>Review</td>
<td></td>
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<td>12/9</td>
<td>Final Exam Dec 9, 7:15PM-9:45PM</td>
<td>Written paper and presentation due</td>
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DISCLAIMER: The instructor reserves the right to make changes to this syllabus as needed. Changes will be announced in class.