

Math 107 - Mathematical Modeling

Course Syllabus

Fall 2017

Instructor : Dr. Edward Burkard
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Office : Copley 234
Office Hours : MWF 17:00-18:30
drop in and by appointment
Class Time : MWF 15:30-16:30
Class Location : Copley 200
Course Webpage : <http://faculty.rmc.edu/edwardburkard/?page=Teaching/107F17>

1. CATALOG COURSE DESCRIPTION

An introduction to techniques for constructing mathematical models of real world phenomena, primarily through the study of discrete dynamical systems. Topics include recurrence relations; stable and unstable equilibria; and systems of linked recurrences. Basic growth patterns will be examined, including linear, power, exponential, and periodic. Applications include financial mathematics, biological systems, and population dynamics. Satisfies CAR Computing.

2. COURSE EXPECTATIONS

In my experience, the statement “I cannot do math” and ones like them are flat out false. For some of you, it may come more easily than others, but this does not mean anyone is innately bad at math (in fact, research backs this up!). What I will ask of you in this class is to give it your best effort and practice regularly. As one of my former teachers would say, “Math is not a spectator sport; you will learn only by doing!”

Please use any and all available resources to help you succeed in this class! I have set office hours, but you are welcome to come by anytime to ask for help. If I’m not otherwise busy, I would love to help you! Also, please use HAC tutoring for help as well! Tutoring will be available in Copley 200 (our classroom) in the evenings. Please visit the HAC’s webpage for the tutoring schedule and to schedule appointments with tutors: <http://www.rmc.edu/academics/academic-support>.

3. TEXTBOOK

There is no textbook that you are required to purchase for this class. The readings for this course, written by Professor Bruce Torrence, are available on Canvas.

4. MATHEMATICA

We will be using Mathematica in this course to explore discrete dynamical systems. Since a discrete dynamical system is *iterative* (meaning that each step is dependent on one or more of the previous steps), Mathematica will be a valuable resource for us as it allows us to compute, say, the 100th step without doing 100 computations. It will also help us visualize data and look for trends in the dynamical system. A student version of Mathematica is available (for free) under the Colleges site license, and you can also use the computers in the classroom. Some assignments will require that you use Mathematica. To download Mathematica, go to www.rmc.edu/departments/mathematics/mathematica.

5. GRADE

There will be 700 total points in this class, distributed as follows:

Item	Homework	Midterms	Final	Class Participation	Total
Points	150	300	200	50	700

Your grade will be determined by the percentage of the total points you've obtained. The grade scale will be no stricter than

Letter	A	B	C	D	F
Cutoff	92%	82%	72%	57%	0%

with +’s and –’s to be used as needed for the final grade only. That is, getting at least 92% will guarantee an A, getting at least 82% will guarantee a B, getting at least 72% will guarantee a C, and getting at least 57% will guarantee a D.

5.1. Exams. There will be 3 midterm exams for this class. The (tentative) exam dates are September 27th, October 30th, and November 29th. Each midterm exam will be worth 100 points. The final is worth 200 points and is on Tuesday, December 12th at 8:30am. Most exam problems will closely resemble those of the worksheets and homework problems. Missed exams may only be made up with an appropriately excused absence. If you are extremely ill and unable to attend an exam you must call or email me **before** the exam and let me know the situation. An unexcused absence from an exam, including the final exam, will result in a score of zero on that exam.

5.2. Homework. As with any mathematics course, homework plays a central role as it is the main way in which you practice new concepts. There will be a total of 200 points divided among 10 homework assignments. Some assignments will be worth more than others. You are encouraged to work on homework with fellow students and to seek as much help as you require from me, the Higgins Academic Center, or any other source, to understand the problem and its solution. The final write-up of the solution, however, should be entirely your own. Homework exercises will be written in Mathematica, and will be printed out and turned in at the beginning of class.

5.3. Class Participation. You are expected to attend class, and a portion of your course grade is based on your active participation. Asking pertinent questions and being engaged during class time contributes positively toward this score. Missing class, arriving late, or using the computers inappropriately contributes negatively. You are asked to NOT surf the web or use the computers during class except at such times as you are instructed to do so, and only for the designated purpose.

6. DISABILITY

Randolph-Macon College is committed to providing access to programs and services for qualified students with disabilities. If you are a student with a disability and require accommodations to participate and complete requirements for this course, notify me immediately and contact the Disability Support Services Office (DSS@rmc.edu or 804-752-7343) for verification of eligibility and determination of specific accommodations.

7. CODE OF ACADEMIC INTEGRITY

Your compliance with the Code of Academic Integrity is assumed at all times in this class. This includes, but is not limited to, submitting your own work (even if you work together on assignments) and not cheating on exams. Please make sure you have read and understand this, which can be found here: <https://issuu.com/rmcstudentlife/docs/fishtales/2?ff=true&e=6746978/38436627>

8. CONDUCT

You are expected to act in a respectable manner. If you are disruptive, you will be asked to leave. If you have a cell phone, please turn it off (or at least place it on silent) during class time. Lectures being interrupted by cell phones going off is disrespectful to everyone in the classroom. You may use a laptop for taking notes or for looking at the lecture notes, but otherwise browsing the internet is unacceptable.

Material in the syllabus may be changed in the event of an unforeseen event (for example: emergencies, school closures). Any changes will be announced in class with a discussion of reasons why.