Math for Liberal Arts Majors I (MGF1106)

Summer B 2023

Course Description: MGF 1106, Mathematics for Liberal Arts I is a general education Mathematics course which is not intended to prepare you for Precalculus or Calculus. Instead, this course is meant to improve general mathematical reasoning skills and cover topics that are broadly applicable in daily life. This course qualifies for both GenEd and Gordon Rule credits.

Instructor and TA Information

Instructor Name: Dr. Ross Ptacek
Office Location: LIT 442
Phone and Email: (352) 294-2350 [department], rptacek@ufl.edu
Preferred form of Contact: Please use Canvas messages or email. For grade inquiries you should use Canvas messages.
Office Hours: MWF 10:40-11:30 AM EST

Role of TA: At present a TA has not yet been assigned to this class, but one will be assigned by the start of the term. The TA information will be in the syllabus on Canvas. In this class the TA's role is to assist in office hours and by answering questions posted on the Canvas discussions. For administrative issues such as grade inquiries, extensions, or makeup work, please contact Dr. Ptacek directly.

Course Materials

- Required Reading and Other Course Materials:

Our textbook is *Excursions in Modern Mathematics, 9th Edition by Peter Tannenbaum.*

The textbook is primarily available as an e-book which **must be purchased using UF All Access**. Instructions for purchasing the textbook are on the Accessing MyMathLab page of the introductory module on Canvas.

All other materials will be presented on the section pages on Canvas. These pages include links to the video lectures and notes. While the video lectures are intended to be comprehensive, students are responsible both for watching the videos and reading the textbook.

- Required Technology:
  - **Zoom:** We will use Zoom for office hours, but that's it. UF's website for Zoom is https://video.ufl.edu/conferencing/zoom/. As a student you will be clicking Zoom links from within Canvas and this should all work automatically.
  - **MyMathLab:** This is the course homework system that we will use. Enrollment in MyMathLab carries its own somewhat lengthy set of instructions which is on the "Accessing MyMathLab" page of the introductory module on Canvas.
  - **Honorlock:** Our exams will be proctored using Honorlock. Honorlock requires installing an extension into the Chrome browser. More details can be found on the "Honorlock" page on Canvas.

Course Format

This course is an **asynchronous online** course. Course content is delivered through video lectures that can be viewed on on Canvas. Each section's videos can be found on on that section's page. The pages are arranged into modules which can be found in the Modules section of Canvas. The slides from which the lectures were given can also be found on the section page.

Participation: Since we are an online class class, participation means interacting with the course materials (e.g. watching videos and reading what I post on Canvas) and being active in the course discussions. Both of these are essential for the smooth running of the course. These materials are designed to answer the most frequently asked administrative questions about the course so that our discussion can be mostly about mathematics. There is a participation grade which is explained in the list of graded work at the end of this document.

Course Content

Thematically, course is divided into three units as follows:

1. **Unit 1: The Mathematics of Social Choice.** We will study methods for carrying out elections (standard and weighted settings). Emphasis is given to mathematical definitions of fairness in these areas and determining the ways in each method can be considered mathematically unfair.
2. **Unit 2: The Mathematics of Chance.** This unit covers the mathematics of randomness. This includes, basic probability theory with an emphasis on expectation and risk management, and statistics from the point of view of normal distributions.
3. **Unit 3: The Mathematics of Shape and Form.** In this unit we lay down the mathematical framework for describing symmetry of 2d and some 3d objects. We also consider fractal geometry, a study of the Mandelbrot set (perhaps the most famous fractal of all), and the connections between randomness and fractals. Along the way we visit the mathematical ideas of complex arithmetic and exponential growth.

Course Learning Goals: At the end of this semester students will be able to

- analyze voting methods in terms of fairness and susceptibility to tactical voting
- determine power in weighted voting systems using the two most commonly used schemes (Banzhaf and Shapley-Shubik)
- find probabilities of events in random experiments
- identify approximately normal distributions and analyze them using the empirical rule
- identify symmetry types of finite objects and infinite border patterns
- construct fractals via replacement rules and study them in terms of area, perimeter, and dimension
- communicate mathematical ideas with their peers

Course Learning Objectives: As is typical in a mathematics course, progress toward class learning goals is measured by solving problems in homework and on timed exams.

Weekly Schedule

What follows is a weekly schedule for the course. Note that when a section is covered in a given week there is a corresponding lecture quiz and homework assignment. Details about these assignments are in the List of Graded Work at the end of this document.

- **Week 1 (7/3 – 7/7).** Intro. Voting Methods: Plurality, Borda count, Elimination methods, Condorcet methods, fairness (1.1 – 1.6). Chapter 1 Quiz.
- **Week 2 (7/10-7/14).** Weighted voting: Coalitions, Banzhaf power, Shapley-Shubik power, combinatorics (2.1 – 2.4). Exam 1 on chapters 1 and 2.
- **Week 3 (7/17 – 7/21).** Probability: Sample space, events, permutations, combinations, Expectation and risk (16.1 – 16.5). Chapter 16 Quiz.
- **Week 4 (7/24 – 7/28).** Data: Mean, median, percentiles (15.2, 15.3) Normality: Normal distributions, empirical rule, modeling with normal distributions, fair and unfair coins (17.1-17.4). Exam 2 on chapters 15, 16, and 17.
- **Week 5 (7/31 – 8/4).** Symmetry: rotations, glide reflections, symmetry types, patterns (11.1 - 11.7). Quiz on Chapter 11.
- **Week 6 (8/7 – 8/11).** Fractals: Replacement Rules, Dimension. Length/Area (Geometric sums), Mandelbrot set (12.1 – 12.4) Exam 3 on chapters 11 and 12.

Honor Code

UF students are bound by The Honor Pledge which states, *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."* The Honor Code (sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Grade Polices

- Grades are assigned A-E with plus/minus grades according to the scale at the bottom of this document. Only a grade of C or higher is considered passing for satisfying degree requirements. Full information on each assignment is given in the List of graded work at the end of this document. Grading in this class is consistent with UF policies available at: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.
- Honor Pledge: UF students are bound by The Honor Pledge which states, *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or*

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- Assignment Values: Point values/percentages for each assignment are given in the List of Graded Work at the end of this document.
- Policy on Late and Make-up Work: Any makeup request or extension **must be made at least a business day prior to the deadline of the assignment** unless an emergency prevents communication. In such cases, documentation must be provided through a DSO instructor notification (https://care.dso.ufl.edu/instructor-notifications/). Makeups and extensions are only approved in the case of official UF business, religious observances, or personal emergency. Makeups and extensions may be denied if the reason for absence was known well ahead of time or if there is little to no progress on assignments when the request is made. Assignments and lectures are made available well in advance of their due date, so students are expected to work around their extracurricular activities within reason. Makeup and extension requests **must be made when the problem arises, not right at the deadline**.
- Grade Return Timing: Most assignments are automatically graded and will return immediately. For any manually graded assignments, please allow one week
- Point Range for this Class: Final grades are assigned based on the total points accumulated in the class. The table is provided as part of the List of Graded Work at the end of this document.

UF Policies

- Contact Hours: "Contact Hours" refers to the hours per week in which students are in contact with the instructor,excluding office hours or other voluntary contact. The number of contact hours in this course equals the number of credits the course offers.
- Workload: As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work outside of class for every contact hour (see https://citt.ufl.edu/resources/course-design-basics/develop-and-implement/considering-student-workload/). Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks. **Note:** Because this is an asynchronous online class we do not have an in-class/out-of-class distinction, so this translates to 3 hours of work per credit hour or roughly 9 hours per week for a Fall or Spring class.
- Accommodation for Student with Disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. This class supports the needs of different learners; it is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

- Statement Regarding Evaluations: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available from the Gatorevals website. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via the evaluation system. Summaries of course evaluation results are available to students at the public results website.
- Statement Regarding Course Recording: We do not have any standard (synchronous) class meetings, and office hours will not be recorded. That's all I have to say about my recording of the class. What follows is the UF policy regarding recording lectures since the passing of House Bill 233.
    - Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.
    - A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.
    - Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

Additional UF Policies and Resources

- **UF Police:** The UF police are together for a safe campus. 392-1111 (or 9-1-1 for emergencies) and https://police.ufl.edu/.
- **Career Connections Center:** Career Connections Center (352-392-1601 | CareerCenterMarketing@ufsa.ufl.edu) connects job seekers with employers and offers guidance to enrich your collegiate experience and prepare you for life after graduation.

- **Counseling and Wellness Center:** Counseling and Wellness Center (352-392-1575) provides counseling and support as well as crisis and wellness services including a variety of workshops throughout the semester (e.g., Yappy Hour, Relaxation and Resilience).
- **Dean of Students Office:** Dean of Students Office (352-392-1261) provides a variety of services to students and families, including Field and Fork (UF's food pantry) and New Student and Family programs
- **Disability Resource Center:** Disability Resource Center (DRCaccessUF@ufsa.ufl.edu | 352-392-8565) helps to provide an accessible learning environment for all by providing support services and facilitating accommodations, which may vary from course to course. Once registered with DRC, students will receive an accommodation letter that must be presented to the instructor when requesting accommodations. Students should follow this procedure as early as possible in the semester.
- **Multicultural and Diversity Affairs:** Multicultural and Diversity Affairs (352-294-7850) celebrates and empowers diverse communities and advocates for an inclusive campus.
- **Office of Student Veteran Services:** Office of Student Veteran Services (352-294-2948 | vacounselor@ufl.edu) assists student military veterans with access to benefits.
- **ONE.UF:** ONE.UF is the home of all the student self-service applications, including access to:
    - Advising
    - Bursar (352-392-0181)
    - Financial Aid (352-392-1275)
    - Registrar (352-392-1374)
- **Official Sources of Rules and Regulations:** The official source of rules and regulations for UF students is the Undergraduate Catalog and Graduate Catalog. Quick links to other information have also been provided below.
    - Student Handbook
    - Student Responsibilities, including academic honesty and student conduct code
    - e-Learning Supported Services Policies includes links to relevant policies including Acceptable Use, Privacy, and many more
    - Accessibility, including the Electronic Information Technology Accessibility Policy and ADA Compliance
    - Student Computing Requirements, including minimum and recommended technology requirements and competencies

List of Graded Work

The following is a list of all graded assignments in the course, their point values, and details about their submission. Following this list is a table showing how final grades are assigned.

Exams

- There are three proctored exams during the term. We will use Honorlock for proctoring.
    - Exam 1 covers material from chapters 1 and 2
    - Exam 2 covers material from chapters 16 and 17
    - Exam 3 covers material from chapters 11 and 12
- You are allowed pencil and scratch paper on the exams but no other notes are allowed.
- Depending on the exam you will either be allowed a four-function or scientific calculator. The only allowed ones are the ones built into Honorlock or the ones at Desmos (https://www.desmos.com/fourfunction, https://www.desmos.com/scientific)
- Each exam is a 60 minute exam, but an extra 15 minutes are added to account for any delays caused by Honorlock.
- **Submission:** Canvas
- **Value:** 3×165 points = 495 points.

Exam Reviews

- Each exam has a corresponding review with questions similar to exam questions.
- Students get unlimited attempts, but the correct answers will only show after the due date.
- Exam reviews are always due at midnight before the exam window begins.
- **Submissions:** Canvas
- **Value:** 5 points × 3 = 15 points

Quizzes

- Every other chapter (1, 16, 11) also has a quiz associated with it. Each assignment from the chapter's **homework must be completed with a score of 60%** to attempt the quiz.
- The quiz is timed (45 minutes) but not proctored.
- Students get two attempts, the better of which counts.
- Unlike lecture quizzes and homework, the chapter quizzes do not stay open until the start of the exam window.
- **Submission:** MyMathLab
- **Value:** 3×50 points = 150 points

Lecture Quizzes

- Each video lecture (approx. 30) has a corresponding lecture quiz to test comprehension of the basic principles of the lecture. The quiz must be completed prior to attempting the corresponding homework.
- The quiz is not timed and is not proctored.
- Five attempts are given, the best of which counts for your grade.
- Lecture quizzes stays open until the beginning of the corresponding exam.

- **Submission:** MyMathLab
- **Value:** 30 × 2 points = 30 points.

Intro Assignments

- There are four introductory assignments due the first week of class.
    1. Chapter O homework: Orientation for the MyMathLab online homework system
        - **Submission:** MyMathLab
        - **Value:** 4 points
    2. Syllabus Quiz: A quiz on commonly missed class policies.
        - **Submission:** Canvas
        - **Value:**4 points
    3. Course Introduction: A post in the Canvas discussions to introduce yourself to your classmates.
        - **Submission:** Canvas
        - **Value:** 4 points
    4. Practice MyMathLab Exam: This lets you experience how Honorlock is used to gain access to password protected/proctored exams.
        - **Submission:** Canvas
        - **Value:** 3 points

Homework

- Each video lecture (approximately 30) has corresponding homework.
- Homework may be attempted any number of times prior to the due date. In general, each exercise is graded without partial credit.
- Homework is due on the first day of the corresponding exam window.
- **Submission:** MyMathLab
- **Value:** Total 250 points (about 20 per week)

Participation

- Students begin with full participation points.
- Participation points can be gained (bonus) by contributing meaningfully to Canvas discussions. They can also be gained for a variety of actions that help the class run more smoothly.
- Participation points can be lost by doing things that hinder the class running smoothly. This includes making disruptive comments on the Canvas discussions but also includes repeatedly asking questions that have been answered in the syllabus or in course announcements.
- **Submission:** None
- **Value: 5** points

Summary

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Homework:          270 Points  (20 points intro + 250 from weekly hw)
Lecture Quizzes:    60 Points  (Approx. 2 per section)
Quizzes:           150 Points  (3 quizzes x 50 points)
Exams:             495 Points  (3 exams x 165 points)
Exam Reviews:       15 Points  (2 reviews x 5 points)
Participation:      10 Points  (Potentially more as bonus)
Total:            1000 Points
```

Grading Scale

Final grades are assigned based on the total points accumulated as shown in the table below.

Passing Grades		Non-Passing Grades	
Letter Grade	**Point Range**	**Letter Grade**	**Point Range**
A	1000-900	C-	620-659
A-	860-899	D+	580-619
B+	820-859	D	540-579
B	780-819	D-	500-539
B-	740-779	E	0-499
C+	700-739		
C	660-699		

The grading scheme above will be strictly adhered to. Partial points are **not** rounded up. The percentage grade shown in Canvas or MyMathLab is a useful **estimate** of your status in the class, but your **final grade is completely determined by your points earned as shown in the Canvas gradebook. If you have not completed assignments, then Canvas will overestimate your percentage.** To estimate your grade, take the percentage in Canvas or MyMathLab as a decimal and multiply by 1000. For example a 75% would estimate that you will complete the course with 0.75*1000=750 points which is a B-. Grade points are assigned as in https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.