MATHEMATICS 2330, FUNCTIONS AND MODELING

Instructor:	***Dr. J. Epperson***		
Office:	PKH 423	**e-mail:**	epperson@uta.edu
Phones:	817-272-5047 (office); 817-272-3261 (Mathematics Department)	**Office Hours:**	M 11-12; W 9-10; or by appointment
Website:	http://wweb.uta.edu/faculty/epperson		
Class Meetings:	Tuesdays & Thursdays 9:30-10:50 in PKH 309		
Course Prerequisite:	A grade of C or above in Math 2425 and acceptance into UTeach Arlington.		
Textbook (Optional):	*Functions in Mathematics: Introductory Explorations for Secondary School Teacher*s by M. Daniels and E. Armendariz (**ISBN-13:** 978-1609271688).		
Course Materials:	• TI 84 calculator • Binder(s) and paper for keeping all classwork and handouts • Optional: Grid paper, colored pencils		
Course Objectives:	In revisiting secondary mathematics, prospective mathematics teachers are expected to: • Deepen and broaden function-related mathematical content knowledge from school algebra to calculus by exploring relevant topics in an inquiry-based learning situation; • Make connections between college mathematics and secondary school mathematics; • Build preliminary knowledge of professional and state mathematics curriculum standards; • Use reflective and collaborative learning, and develop a stronger sense of professionalism and leadership; • Create efficient seekers of content knowledge; • Explore and learn appropriate use of technology in the mathematics classroom.		
Class Format:	I will conduct the course in a seminar-style manner with few lectures. I will normally act as a "moderator" while you (the students) present exercises and justifications to one another. I will answer appropriate questions and steer discussions into productive channels. You will engage in explorations and lab activities designed to strengthen and expand your knowledge of topics grounded in secondary school mathematics. You will collect data and explore a variety of situations that can be modeled using linear, exponential, polynomial, and trigonometric functions. The activities are designed to take a second, deeper look at topics studied previously; illuminate the connections between secondary and college mathematics; illustrate good, as opposed to typically poor, sometimes counterproductive, uses of technology in teaching; illuminate the connections between various areas of mathematics; and engage you in non-routine problem solving, problem-based learning, and applications of mathematics. While there is some discussion of how		

	the content relates to secondary mathematics instruction, the course primarily emphasizes mathematics content knowledge and content connections, as well as applications of the mathematics topics covered.
Electronic Communication:	UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

Details About the Course

Grades:

Exam 1	**20%**
Exam 2	**20%**
Written Assignments/Labs/Homework	**25%**
Attendance/Engagement and Contribution	**10%**
Midterm Project	**10%**
Final	**15%**
Total	**100%**

Grades will be assigned according to the following scheme (approximately):

90–100	**A**
80– 89	**B**
70– 79	**C**
60– 69	**D**
59 or below	**F**

Late Work:
In general, late work will not be accepted. One half of the assigned points will be deducted for work that is submitted after the due date if there is a legitimate and documentable excuse.

Attendance:
Since the majority of this work relies upon group work done during class time, regular attendance is critical. You are expected to be in class each day. Everyone begins the semester with 100 attendance points. Two points will be deducted for each absence. If you contact the instructor before the class begins (and receive confirmation of receipt of message), only one point will be deducted. One point will be deducted for each tardy after the first. If you leave class early or consistently choose not to participate, points will be deducted.

Help Outside of Class Time:
My office hours are given above. These are times when I will be available in my office to discuss the material/homework/tests. No appointment is necessary for those times. If, however, those times are inconvenient for you, then make an appointment with me for another time (e.g., e-mail me stating the times you prefer). *Please use the subject heading "**Math 2330 Student Question**" when sending Dr. Epperson e-mail and identify yourself (full name) in the communication.*

My web page will list the homework as the term progresses as well as other miscellaneous information pertinent to this course. My web-page address is above.

Cell Phone, Laptops, Beeper, & Chiming Watch Etiquette:

- Cellular phones should be either switched off or set to "silent" mode during all classes. Cellular-phone use will not be permitted in class. If you must take an important call, please leave the classroom.
- Cellular phones are prohibited during exams.
- Beepers should be either switched off or set to "silent" mode during all classes and during tests.
- You should assure that watches with alarms and chirps will not sound during class.
- Since lecture focuses on interpersonal communication, students must request permission to use a laptop during class time.

Tests/Labs/Homework:
There will be frequent homework assignments, labs, and exams to test your knowledge of the concepts covered in class. Tests and labs will be in class; homework is to be completed outside of class time.

- We will work on explorations in class almost every class meeting.
- You are expected to write up the explorations we work in class by the next class meeting. In general, I will not grade these explorations, but I will call students to the board to present work or provide explanations based upon these. Thus, failure to come to class with your write-ups will result in my lowering your participation grade for the day.
- You will be expected to keep a portfolio of the explorations from class for each unit. The portfolio will consist of your written work on the explorations and tech/prep exercises. Each portfolio will be graded on a holistic grading rubric and will contribute 5 points to each exam grade.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).

Course Schedule[1]:

Day		Date	Topic or Activity
1		22-Aug	1st Day Handouts; Problem Solving - Conundrum; Explorations 1.1-1.3
2	**UNIT 1 Functions and Patterns**	27-Aug	Definition of Function; Function Sorting Activity; Writing - Def. of Function
3		29-Aug	3 Definitions of Function. Parabola Roots Exploration
4		3-Sep	A qualitative look at 'rate of change' of *f*; Continue Exploration 3.2
5		5-Sep	Conic Sections; **Homework 1**
		9-Sep	CENSUS DATE
6		10-Sep	Conic Sections continued
7		12-Sep	Spring Mass Lab
8		17-Sep	Sequences. Triangular Differences Activity; **Homework 1 DUE**
9		19-Sep	Triangular Differences continued; **Homework 2**
10		24-Sep	Functions as Sequences (i.e. Function Patterns)
11		26-Sep	Function Patterns Exploration; **Homework 2 DUE**
12		1-Oct	Exponential Growth/Decay; Rate of Change
13	**UNIT 2 Modeling Using Regression & Matrices**	3-Oct	Modeling Functions from data; Thunder Storms, Charles Law, & Linear Regression
14		8-Oct	**EXAM 1; Portfolio on Unit 1 DUE**
15		10-Oct	Modeling Functions from data; More regression; Residuals; Midterm Assignment
16		15-Oct	Terminal Velocity Lab; **Homework 3**
17		17-Oct	Modeling Functions from Data: Data with Matrices
18		22-Oct	Modeling Functions from Data: Standard Forms; **Homework 3 DUE**
19		24-Oct	Roller Coaster Exploration
20	**UNIT 3 Exploring Functions in Other Systems**	29-Oct	Parametric models; **Midterm Assignment DUE**
21		31-Oct	**EXAM 2; Portfolio on Unit 2 DUE**
22		5-Nov	Parametric Exploration Problems
23		7-Nov	The Golf Shot - An Exploration
24		12-Nov	Vector Lab; **Homework 4**
25		14-Nov	Polar Coordinate System
26		19-Nov	Geometry of Complex Numbers
27		21-Nov	Geometry of Complex Numbers continued; **Homework 4 DUE**
28		26-Nov	Polar Complex- Euler Numbers
29		3-Dec	Polar Complex- Euler Numbers continued; Review
30		12-Dec	**FINAL EXAM 8-10:30 a.m.; Portfolio on Unit 3 DUE**

[1] As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Dr. James A. M. Epperson

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Student responsibility primarily rests with informing faculty **at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are appropriately accommodated.

Academic Integrity: Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

> *I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*
>
> *I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Grade Replacement and Grade Exclusion Policies: These policies are described in detail in the University catalog and can also be founded online at
http://wweb.uta.edu/catalog/content/general/academic_regulations.aspx#10
(scroll about half way down the page).

Student Disruption: The University reserves the right to impose disciplinary action for an infraction of University policies. For example, engagement in conduct, alone or with others, intended to obstruct, disrupt, or interfere with, or which in fact obstructs, disrupts, or interferes with, any function or activity sponsored, authorized by or participated in by the University.

Drop for Non-Payment of Tuition: If you are dropped from this class for non-payment of tuition, you may secure an Enrollment Loan through the Bursar's Office.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.