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 11:00-12:20 in PKH 311
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 classwork and handouts - Optional: Grid paper, colored pencils
Course Prerequisite:	A grade of C or above in Math 2425 and acceptance into UTeach Arlington.
Course Objectives:	In revisiting secondary mathematics, prospective mathematic 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 Statement:	**From the UT-Arlington undergraduate catalog**: E-mail is a prime means for communication. Therefore, the University has the right to send communications to students via e-mail and the right to expect that those communications will be received and read in a timely fashion. The Office of Information Technology (OIT) will assign all students an official University e-mail address. It is to this official address that the University will send e-mail communications. <u>Students are expected to check their official e-mail account on a frequent and consistent basis to stay current with University communications. The University recommends checking e-mail daily in recognition that certain communications may be time-critical.</u>

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* <u>*subject heading*</u> *"**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, 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.

<u>Since lecture focuses on interpersonal communication, students must request permission to use a laptop during class time.</u>

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. 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.

Course Schedule:

Day		Date	Topic or Activity
1		15-Jan	1st Day Handouts; Problem Solving - Conundrum; Explorations 1.1-1.3
2	**UNIT 1 Functions and Patterns**	17-Jan	Definition of Function; Function Sorting Activity; Writing - Def. of Function
3		22-Jan	3 Definitions of Function. Parabola Roots Exploration
4		24-Jan	A qualitative look at 'rate of change' of *f*; Continue Exploration 3.2
5		29-Jan	Conic Sections; **Homework 1**
		30-Jan	CENSUS DATE
6		31-Jan	Conic Sections continued
7		5-Feb	No Class: Online Activity
8		7-Feb	Spring Mass Lab
9		12-Feb	Sequences. Triangular Differences Activity; **Homework 1 DUE**
10		14-Feb	Triangular Differences continued; **Homework 2**
11		19-Feb	Functions as Sequences (i.e. Function Patterns)
12		21-Feb	Function Patterns Exploration; **Homework 2 DUE**
13		26-Feb	Exponential Growth/Decay; Rate of Change
14	**UNIT 2 Modeling Using Regression & Matrices**	27-Feb	Modeling Functions from data; Thunder Storms, Charles Law, & Linear Regression
15		5-Mar	**EXAM 1; Portfolio on Unit 1 DUE**
16		7-Mar	Modeling Functions from data; More regression; Residuals; Midterm Assignment
17		19-Mar	Terminal Velocity Lab; **Homework 3**
18		21-Mar	Modeling Functions from Data: Data with Matrices
19		26-Mar	Modeling Functions from Data: Standard Forms; **Homework 3 DUE**
20		27-Mar	Roller Coaster Exploration
21	**UNIT 3 Exploring Functions in Other Systems**	2-Apr	Parametric models; **Midterm Assignment DUE**
22		4-Apr	**EXAM 2; Portfolio on Unit 2 DUE**
23		9-Apr	Parametric Exploration Problems
24		11-Apr	The Golf Shot - An Exploration
25		16-Apr	Vector Lab; **Homework 4**
26		18-Apr	Polar Coordinate System
27		23-Apr	Geometry of Complex Numbers
28		25-Apr	Geometry of Complex Numbers continued; **Homework 4 DUE**
29		30-Apr	Polar Complex - Euler Numbers
30		1-May	Polar Complex - Euler Numbers continued; Review
31		7-May	**FINAL EXAM 11-1:30 p.m.; Portfolio on Unit 3 DUE**

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.

As a faculty member, I am required by law to provide "**reasonable accommodation**" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty <u>at the beginning of the semester</u> 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: All 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.

Instructors 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.

Academic Dishonesty: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents Rules and Regulations, Part One, Chapter IV, Section 3, Subsection 3.2, Subdivision 3.22)

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.

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.