Course Syllabus – Functions and Modeling – Spring 2013 Semester

Date/Time: MW 11:30– 12:45 FN3.410 Jan 14th – May 13th	
Instructor	
Instructor: Amin Lalani Office Phone: 972-883-6451 Office Hours: M_W_F from 9:00 to 12:00 E-mail: amin.lalani@utdallas.edu	Instructor: Bill Gammons Location: FN 3.410C Office Phone: 972-883-6444 Office Hours: M_W_F from 9:00 to 12:00 E-mail: bill.gammons@utdallas.edu

Class Location

Room Number: FN 3.410C

Course Prerequisite(s)

- Successful completion of Step 2 Mathematics Course and Calculus I
- An interest in exploring teaching
  NOTE: a TI Nspire calculator is optional to use at home. We have class sets to use in class.

Course Description/Overview

In this course, you will engage in explorations and lab activities designed to strengthen and expand your knowledge of the topics found in secondary mathematics. Course activities are designed to have you take a second, deeper look at topics you should have been exposed to 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 serious (i.e., non-routine) problem solving, problem-based learning, and applications of mathematics.

The course consists of four units: 1) Functions, 2) Modeling, 3) Overlooked Topics and Explorations, and 4) Geometry of Complex Numbers. Specific topics of investigation include function properties and patterns, complex numbers, parametric equations, polar equations, vectors, and exponential growth and decay. Explorations involve the use of multiple representations, transformations, data analysis techniques (such as curve fitting) and interconnections among topics in algebra, analytic geometry, statistics, trigonometry, and

calculus. The lab investigations include use of various technologies including computers, calculators, and computer graphing software.

Course Schedule

Class	Topic
Topic 1:	Course Orientation
Unit 1: Functions	
Topic 2:	Function Sorting
Topic 3:	Complex Roots
Topic 4:	Qualitative Graphing
Topic 5:	Conic Sections Test # 1-Topics 1-5 around 1/30 (In Class)
Topic 6:	Trigonometry Functions & Applications
Topic 7:	Sequences
Topic 8:	Difference Columns
Topic 9:	Function Patterns, Part 1
Topic 10:	Function Patterns, Part 2
Unit 2: Modeling	
Topic 11:	Modeling Functions and Linear Regression
Topic 12:	More Regression and Residuals Test # 2 – Topics 6-12 around 2-28 (outside class test)
Topic 13:	Modeling Functions with Matrices, Part 1
Topic 14:	Terminal Speed Lab
Topic 15:	Modeling Functions with Matrices, Part 2
Unit 3: Overlooked Topics and Explorations	
Topic 16:	Parametric Models
Topic 17:	Parametric Explorations Test # 3 – Topics 13 – 17 around 3-27 (Outside class test)
Topic 18:	Polar Coordinate System
Topic 19:	Exponential/Logistic Models
Topic 20:	Vector Lab
Topic 21:	Comprehensive Applications, Part 1
Topic 22:	Comprehensive Applications, Part 2 Test # 4 – Topics 18 – 22 around 4-10 (In Class)
Unit 4: Geometry of Complex Numbers	
Topic 23:	Geometry of Complex Numbers
Topic 24:	Polar Complex Numbers
Topic 25:	Mandelbrot Set
Topic 26:	Wrap-up and Review Day 1
Topic 27:	Wrap-up and Review Day 2 Comprehensive Final Exam Due by 5-10

Course Objectives and Expectations

Course Objectives and Evidence of Student Learning	
Students will be able to…	***Evidence of Student Learning:***
demonstrate a depth of content knowledge with regard to important secondary mathematics topics such as parametric relations, polar relations, matrices, exponential and logarithmic functions, vectors, and complex numbers.	• classroom activities, student presentation of findings, assessments, and classroom performance
generate or work with relevant lab or exploration data and use regression, matrix, function pattern, and systems methods to generate a model the data.	• classroom activities and classroom lab write up
present mathematical ideas and topics in a knowledgeable and effective manner.	• classroom presentations of findings and classroom performance
demonstrate proficiency in the use of technology in the mathematics classroom.	• classroom activities, labs, assessments, and classroom performance
identify mathematics content connections between the various levels of secondary mathematics curriculum and between secondary and university level curriculum.	• classroom activities, student presentation of findings, and classroom performance

Expectations

1. Because a majority of the learning hinges on group work done during the class time, attendance is of utmost importance. Four points will be deducted for each absence. If you contact your instructor before the class begins, only two points 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. NOTE: I reserve the right to lower your grade by one letter or fail you for excessive absences and/or failure to participate.
2. You are expected to enter classroom discussions having completed extended research of assigned topics outside of the classroom.
3. You must attempt all assigned problems and show all work in order to receive full credit.
4. You must not use cell phones during class. Everybody has emergencies so if you get an important call please step out of class to take the call.

Assignments/Grading Policy

Activities	Points
Tests. There will be three to four exams to test your knowledge of the concepts we are currently discussing in class. Exams must be taken outside of class time on the day assigned.	30
Written Assignments, Labs, Homework, Video Tagging & Online Discussion. There will be frequent in-class and take-home explorations and labs, as well as three or four major unit homework assignments. In addition each of you will teach a concept to the class sometime during the semester. Also, you will be trained to watch and tag a 1hr video. Finally, every two weeks you will have an online discussion dealing with High School Mathematics Topics.	20
Attendance, Engagement, and Contributions. Since a majority of this work hinges on group work done during the class time, attendance is of utmost importance and you are expected to be in class each and every day. We will also do note booking in this class which will be part of this grade. Four points will be deducted for each unexcused absence.	20
Project. You will be required to do a semester project with parts due at different times of the semester.	15
Final Exam. This is a comprehensive final, sampling from all that we have talked about.	15
TOTAL	**100**

Homework Policy

- Assignments are due on the due date; **no late work will be accepted**.
- **Assignments are due at the beginning of class**, without being asked, unless told otherwise.
- If you are absent the day an assignment is due, it is due at the start of the next class in attendance. Bookwork is due the day it is due, unless told otherwise. If you are absent the day any other homework is assigned, then the work will be distributed the next class in attendance and is due the next immediate after that.
- Work is expected to be completed on the paper given. If additional space is required, attach it to the original.
- Multiple assignments bundled into one submission will not be accepted.
- Collaboration on assignments is prohibited unless stated otherwise.

Grading Scale

A +	>=	96
A	>=	93
A -	>=	90
B+	>=	86
B	>=	83
B-	>=	80
C+	>=	76
C	>=	73
C-	>=	70

Field Trip Policies
Off-campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and

activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

UT Dallas Practicing Teacher Compliance Policies

As a student in this course, you are expected to comply with Texas Administrative Code (TAC), Title 19, Part 7, Chapter 247, Rule §247.2 – Code of Ethics and Standard Practices for Texas Educators and the UT Dallas Fitness to Teach Policy.

http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=19&pt=7&ch=247&rl=2

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official

student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office

hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.