COURSE SYLLABUS: Math 2384-01, 3 credit hours, FALL 2017
Functions and Graphs

CLASSROOM AND SCHEDULE: Tuesday and Thursday, 11:00 AM - 12:20 PM
Lee Drain Building, Room 403

INSTRUCTOR: Dr. Mary Swarthout
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Office Hours:
Monday & Wednesday: 10:00 – 11:30 AM
Tuesday & Thursday: 8:30 – 9:15 AM and 1:30 – 2:30 PM
Other Times by Appointment

CATALOG DESCRIPTION: This course continues the mathematics course sequence for elementary teachers who are pursuing a mathematics minor. This course may be applied only toward elementary school teacher certification. Students are expected to practice communications skills and participate in hands-on activities, including the use of math manipulatives and technology. Topics will include National and Texas standards for teaching linear, polynomial, logarithmic, exponential, and trigonometric functions. Students will also participate in class discussions and group work during this course. **A TI-83+ or TI-84 graphing calculator, or TI-Inspire is required for this course.**
Prerequisite: Math 1384 and Math 1385 with a grade of C or better.

COURSE OBJECTIVES: Upon completion of this course, students will be able to:

- Make, test, validate, and use conjectures about patterns and relationships in data presented in tables, sequences, and graphs.
- Give appropriate justification of the manipulation of algebraic expressions.
- Illustrate the concept of a function using concrete models, tables, graphs, and symbolic and verbal representations.
- Use transformations to illustrate properties of functions and relations and to solve problems.
- Demonstrate an understanding of the connections among linear functions, proportions, and direct variation.
- Determine the linear function that best models a set of data.
- Analyze the relationship between a linear equation and its graph.
- Use linear functions, inequalities and systems to model problems.
- For both linear and quadratic functions, use a variety of representations and methods (e.g., numerical methods, tables, graphs, algebraic techniques) to solve systems of equations and inequalities.
- Demonstrate an understanding of the characteristics of linear models and the advantages and disadvantages of using a linear model in a given situation.
- Use a variety of methods to investigate the roots (real and complex), vertex, and symmetry of a quadratic function or relation.
- Demonstrate an understanding of the connections among geometric, graphic, numeric, and symbolic representations of quadratic functions.
- Analyze data and represent and solve problems involving exponential growth and decay.
- Demonstrate an understanding of the connections among proportions, inverse variation and rational functions.
- Understand the effects of transformations such as $f(x \pm c)$ on the graph of linear and nonlinear functions $f(x)$.

- Apply properties, graphs, and applications of nonlinear functions to analyze, model, and solve problems.
- Understand how to use properties, graphs, and applications of nonlinear relations including polynomial, rational, radical, absolute value, exponential, logarithmic, trigonometric, and piecewise functions and relations to analyze, model and solve problems.

TEXT AND MATERIALS:

Connally, E., Hughes-Hallet, D, Gleason, A., et al. (2015). *Functions Modeling Change : A Preparation for Calculus* (5th Edition). Hoboken, NJ: John Wiley & Sons.

A **TI-83+, TI-84, or TI-Inspire graphing tool is required for this course.**

Up-to-date course information will be posted on Blackboard. **Please check Blackboard regularly!**

COURSE OUTLINE:

Chapter 1 Linear Functions and Change
Chapter 2 Functions
Chapter 3 Quadratic Functions
Chapter 4 Exponential Functions
Chapter 5 Logarithmic Functions
Chapter 6 Transformations of Functions and Their Graphs
Chapter 7 Trigonometry and Periodic Functions
Chapter 8 Triangle Trigonometry
Chapter 10 Compositions, Inverses, and Combinations of Functions
Chapter 11 Polynomial and Rational Functions

Other material may be covered as time permits.

COURSE EVALUATION:

Category	Points Possible
HW Checks (top 8 of 10 @ 5 points each)	40
Online Quizzes (top 5 scores of 7 @ 10 points each)	50
Writing Task Assignments (4 @ 10 points)	40
3 Unit Tests (100 points each)	300
Final Exam (Comprehensive)	125
Total	**555**

Grading Scale:

Points earned	499 – 555	444 – 498	388 – 443	333 – 387	less than 333
Course grade	A	B	C	D	F

Course Format:

Throughout the course of the semester, students will have a number of ways to demonstrate proficiency in learning the material. For all categories, **NO LATE WORK WILL BE ACCEPTED**. If a student knows that he or she will be absent, he or she may turn in your assignment early, drop it by the instructor's office, or send it by email by class time of the due date.

HW Checks: One of the indicators of the understanding of a concept is the ability "to state it in your own words". Communicating your understanding will be shown through your complete solutions to assigned homework problems and through written responses/reflections to readings, questions, situations, or other topics related to your study of mathematics. These responses will be collected **10** times over the course of the semester and be **worth 5 points** each. Your **best 8 of 10** will be counted toward your final point total. HW Checks can include in-class work as well as out-of-class assignments.

Online Quizzes: There will be 7 quizzes over the course of the semester. The quizzes will be related to the readings, activities, and HW assignments you complete. Your lowest 2 quiz scores will be dropped.

Writing Task Assignments: For four of the many investigation tasks/activities used in class during the semester, an individual written response with complete explanations, discussion, visual/graphic illustrations, correct mathematical vocabulary and symbol usage, correct grammar and spelling for the topic explored will be submitted for evaluation. Each submission will be made through a *Turnitin* link posted in the course Blackboard site as a WORD or PDF file. Each summary paper will be worth 10 points.

Tests: Tests will include some problems that are similar to problems assigned and worked in class. A portion of each test will include multiple choice or short answer problems. Each test will have a section completed without the use of a calculator. Each test will include problems where students must show all of their work correctly, as well as arrive at the correct solution to the problem, or provide complete explanations for the problem or situation posed.
Test Dates: **September 21, October 19, and November 21**
If you are unable to take a test due to an Official University excused absence, arrangements for taking the test must be made in advance of the scheduled test date. If you miss a test due to an emergency situation, contact Dr. Swarthout as soon as possible but must be prior to the next class meeting for any possibility of taking a makeup test. If you miss a test and a makeup test is not possible, your final exam percentage grade will be used as a replacement.
Final Exam: The final exam will be comprehensive.
Final Exam Date: **Thursday – DECEMBER 7 from 12:00 – 2:00 pm**

Expectations:

- ✓ Check Blackboard regularly for assignments, announcements, grades, changes in calendar.
- ✓ Communicate with your course instructor for any concerns that could affect your learning, attendance, and participation in class.
- ✓ Observe regular attendance; prepare to actively participate in class by completing all reading assignments and practice exercises before coming to class.
- ✓ Engage in team collaboration and active listening.
- ✓ Engage in thoughtful reflections on learning opportunities.

ATTENDANCE: Regular and punctual attendance is expected of every student. As a prospective teacher, you must demonstrate your reliability and conscientious attitude by your attendance. Attendance will be taken every class. Any student who is 30 minutes late to class or leaves before class is over (without approval of the instructor) will be counted absent. If absent or tardy, you are still responsible for all material covered in class, and you will need to check with a classmate or instructor about what was discussed. **Note**: Some points for assignments will come from in-class work - if you are absent, you lose that opportunity.

CLASSROOM RULES OF CONDUCT
Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. **Cellular telephones and pagers must be turned off before class begins.** Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Use of Telephones and Text Messagers in Academic Classrooms and Facilities: The use by students of electronic devices that perform the function of a telephone or text messager during class-time may be prohibited if deemed disruptive by the instructor to the conduct of the class. Arrangements for handling potential emergency situations may be granted at the discretion of the instructor. Failure to comply with the instructor's policy could result in expulsion from the classroom or with multiple offenses, failure of the course. Any use of a telephone or text messager or any device that performs these functions during a test period is prohibited. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used by the student. Even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty (see student code of conduct http://www.shsu.edu/students/guide/StudentGuidelines2010-2012.pdf#page=29).

STUDENTS WITH DISABILITIES POLICY:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

VISITORS IN THE CLASSROOM

Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

STUDENT ABSENCES ON RELIGIOUS HOLY DAYS POLICY

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will provide the student with a written description of the deadline for the completion of missed assignments and/or tests.

Academic Dishonesty Policy

1. GENERAL
The subject of academic honesty is addressed in paragraph 5.3, Chapter VI, of the *Rules and Regulations*, Board of Regents, The Texas State University System, and Sam Houston State University *Student Guidelines* published by the Office of Student Life.

5.3 Academic Honesty. The University expects all students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action.

5.31 The University and its official representatives, acting in accordance with Subsection 5.32 may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating, plagiarism, collusion, and the abuse of resource materials.

"Cheating" includes the following and similar actions:
(1) Copying from another student's test paper, laboratory report, other report, or computer files, data listings, and/or programs.
(2) Using, during a test, materials not authorized by the person giving the test.
(3) Collaborating, without authorization, with another student during an examination or in preparing academic work.
(4) Knowingly, and without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of an un-administered test.
(5) Substituting for another student, permitting any other person, or otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit.
(6) Bribing another person to obtain an un-administered test or information about an un-administered test.
(7) Purchasing, or otherwise acquiring and submitting as one's own work any research paper or other writing assignment prepared by an individual or firm. This section does not apply to the typing of the rough and/or final versions of an assignment by a professional typist.

5.32 "Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea into one's own work offered for credit.

5.33 "Collusion" means the unauthorized collaboration with another person in preparing work offered for credit.

5.34 "Abuse of resource materials" means the mutilation, destruction, concealment, theft or alteration of materials provided to assist students in the mastery of course materials.

5.35 “Academic work” means the preparation of an essay, dissertation, thesis, report, problem, assignment, or other project that the student submits as a course requirement or for a grade.

2. PROCEDURES IN CASES OF ALLEGED ACADEMIC DISHONESTY

2.01 Procedures for discipline due to academic dishonesty shall be the same as in disciplinary actions specified in The Texas State University System *Rules and Regulations* and Sam Houston State University *Student Guidelines* except that all academic dishonesty actions shall be first considered and reviewed by the faculty member teaching the class. The faculty member may impose failure or reduction of a grade in a test or the course, and/or performing additional academic work not required of other students in the course. If the faculty member believes that additional disciplinary action is necessary, as in the case of flagrant or repeated violations, the case may be referred to the Dean of Student Life or a designated appointee for further action. If the student involved does not accept the decision of the faculty member, the student may appeal to the chair of the appropriate academic department/school, seeking reversal of the faculty member's decision.

2.02 If the student does not accept the decision of the chair of the academic department/school, he/she may appeal to the appropriate academic dean. The chair of the academic department/school may also refer the case directly to the academic dean if the case so warrants.