#### COURSE SYLLABUS MATH 4385, Section 01 Fall 2017 MATHEMATICAL PROBLEM SOLVING CREDIT HOURS: 3

CLASSROOM AND SCHEDULE: Lee Drain Building, Room 424 Tuesday & Thursday, 12:30 p.m. – 1:50 p.m.

**INSTRUCTOR:** Dr. Linda Zientek

Office: Room 421B, Lee Drain Building Phone: 936-294-4874 Email: <u>lrzientek@shsu.edu</u> Office Hours: Tues/Thurs, 7:30 – 8:00, 11:00 – 12:20 Other Appointments by special arrangement

FAX: 936-294-1882

**COURSE DESCRIPTION:** This course is designed to help prospective secondary mathematics teachers deepen their mathematical background by examining high school mathematics topics at a more sophisticated level. As such, it extends and connects concepts from algebra, geometry, and calculus, including functions, graphs, complex numbers, trigonometry, and number systems. This is accomplished by using problem-solving techniques, graphical and numerical methods, and proofs. Prerequisite: THEA score of 270 or its equivalent. 3 semester hours.

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

- Understand and apply the problem-solving process.
- Understand the algebraic structure and its use in solving equations.
- Understand the properties of the complex number system.
- Understand and use various representations of complex numbers.
- Understand the relationship among the unit circle in the coordinate plane, circular functions, and the classic trigonometric functions.
- Use technology to solve problems and illustrate mathematical concepts.
- Understand and solve problems involving mathematics of finance.
- Use exponential and logarithmic functions to model and solve problems involving mathematics of finance.
- Solve problems related to 2 and 3 dimensional figures (area, surface area, volume).

## **REQUIRED TEXTBOOK:**

Usiskin, Z, Peressini, A., Marchisotto, E., & Stanley, D. (2003). *Mathematics for High School Teachers: An Advanced Perspective*. Prentice Hall Publishers: New Jersey. ISBN 978-0130449412. (Additional materials will be provided on Blackboard.)

## **FREE DOWNLOADS:**

- GeoGebra, <u>www.geogebra.org</u>
- Texas Examinations of Educator Standards (TExES) Program Preparation Manual: Mathematics 7–12

http://cms.texes-ets.org/texes/prepmaterials/texes-preparation-manuals/

 Chapter 111. Texas Essential Knowledge and Skills for Mathematics, Subchapter C: High School <u>http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111c.html</u> SUPPLIES: To be ready for action during each class, you will need to have:

- appropriate class materials as identified by the instructor
- a graphing calculator (TI 83/84/84+ or NSpire)

**BLACKBOARD:** Up-to-date course information will be posted on Blackboard, including deadlines, notes, and assignments. **Please check Blackboard regularly.** 

**ATTENDANCE POLICY:** Regular and punctual attendance is expected of every student. As a prospective teacher, you must demonstrate your reliability and conscientious attitude by your faithful attendance. Students who are absent or tardy are still responsible for all material covered in class. Course grades may be lowered up to one-half letter grade for each absence in excess of two class periods. Serious health or family problems that are well documented will be handled individually.

In addition to attending class faithfully, students are expected to put forth their best effort in this class. This includes, but is not limited to, actively participating in class discussions and activities. By way of contrast, *unprofessional behaviors will not be tolerated*. Unprofessional behaviors include sleeping, texting, laying your head on the desk, reading the newspaper, or studying for other classes.

**ASSIGNMENTS:** There will be three types of assignments: In-class group assignments, in-class individual assignments, and homework assignments. Some (but not all) of these assignments will be collected for credit. You will receive credit by presenting some (but not all) of your solutions in class. Late assignments do not exist. A missed in-class assignment or presentation cannot be made up.

**EXAMS:** There will be two major examinations in this course. You should notify your instructor in advance if you must miss a class during which time a major examination is scheduled. The instructor, at his discretion, may allow you to take the exam early. In the event that this is not possible, the final exam grade will replace the exam missed.

### **COURSE ASSESSMENT:**

- Assignments: (25%) Assignments will consist of in-class activities, essays, presentations, and standard homework problems.
- *Quizzes* (15%) These will be short assessments (15-20 minutes) given throughout the semester. You will be given at least one class day's notice of an upcoming quiz. Make up quizzes given only with advance notice.
- *Exams* (60%) Two semester exams (20% each) and a comprehensive final (20%) are required.

### Grading scheme:

Α	90% to 100%
B	80% to 89%
С	70% to 79%
D	60% to 69%
F	Less than 60%

Course assessments and grading scheme may be modified during the semester. Students will be notified of any changes as soon as possible.

**COMMUNICATION SKILLS STATEMENT:** The ability to express ideas clearly is essential to the mastery of mathematics. Students, therefore, must be able to write and speak clearly about mathematical concepts.

Good assignments, projects, and presentations are characterized by:

- correct mathematics;
- a distinctly articulated thesis;
- appropriate use of English grammar and correct spelling;
- a well-organized topic with a beginning, middle, and end;
- unambiguous explanations of ideas, regardless of how complicated a topic might be; and
- thorough checking of written materials.

Failure to meet the above standards could result in lower grades.

**ACADEMIC DISHONESTY:** All students are expected 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. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

**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 and stored out of sight before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers and magazines, 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.

### **TELEPHONES AND MESSAGING DEVICES:**

**CELL PHONE & TEXT MESSAGERS USE: SHSU Academic Policy Statement 100728** Telephones and similar devices have become increasingly a part of everyday life. In the academic classroom, however, during class these devices can be a serious distraction and during tests they can be a serious problem. The technology is constantly changing and evolving. So, the present policy does not specify particular devices or device types. Rather, the policy applies to any device that performs the function of a telephone or text messenger. Failure to comply with the instructor's policy could result in expulsion from the classroom or with multiple offenses, failure of the course.

The use by students of electronic devices that perform the function of a telephone or text messager during class-time is **prohibited**. Arrangements for handling potential emergency situations may be granted at the discretion of the instructor. *Failure to comply with this 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.

**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. This policy is not intended to discourage the occasional visiting of classes by responsible persons. Obviously, however, the visiting of a particular class should be occasional and not regular, and it should in no way constitute interference with registered members of the class or the educational process.

**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. <u>Any student</u> <u>with a disability that affects his/her academic performance should contact the Office of Services</u> for <u>Students with Disabilities in the SHSU Lee Drain Annex (telephone 936-294-3512, TDD 936-</u> <u>294-3786) to request accommodations.</u> 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/aps/aps-students.html

**STUDENT ABSENCES ON RELIGIOUS HOLY DAYS:** University policy states that a student who is absent from class for the observance of a religious holy day must be allowed to take the examination or complete an assignment scheduled for that day within a reasonable time after the absence. Students will be excused to travel for observance of a religious holy day. A student who wishes to be excused for a religious holy day must present the instructor with a written statement describing the holy day(s) and the travel involved. The instructor will then provide the student with a written description of the deadline for the completion of missed exams or assignments.

# **TENTATIVE SCHEDULE**

Tuesdays		Thursdays	
		Aug.	Introductions: TEKS & TExES
		24	Levels of Cognitive Demand
			Standards, Curriculum, &
			Assessment
Aug.	4.1 The Concept of Equation	Aug	4.1 The Concept of <i>Equation</i>
29		31	
Sept. 5	4.2 Algebraic Structures and	Sept. 7	4.2 Algebraic Structures and Solving
_	Solving Equations	_	Equations
			4.3 The Solving Process
Sept.	2.2 The Complex Numbers	Sept.	2.2 The Complex Numbers
12	_	14	QUIZ on Chapter 4
Sept.	2.2 The Complex Numbers	Sept.	2.2 The Complex Numbers
19		21	
Sept.	2.2 The Complex Numbers	Sept.	EXAM 1
26		28	
Oct. 3	9.1 Angular Measure and the	Oct. 5	9.2 The Trigonometric Functions and
	Trigonometric Ratios		Their Connections
Oct.	9.2 The Trigonometric Functions	Oct.	9.3 Properties of the Sine and Cosine
10	and Their Connections	12	Functions
Oct.	9.3 Properties of the Sine and	Oct.	QUIZ on Chapter 9
17	Cosine Functions	19	
Oct.	Mathematics of Finance	Oct.	Mathematics of Finance
24		26	
Oct.	Mathematics of Finance	Nov. 2	Mathematics of Finance
31			
Nov. 7	EXAM 2	Nov. 9	Writing Assignment
Nov.	Solid Geometry	Nov.	10.2 Volume
14		16	
Nov.	10.2 Volume	Nov.	NO CLASS MEETING –
21		23	Thanksgiving Holiday
Nov.	10.2 Volume	Nov.	Review for Final Exam
28	QUIZ on Geometry and Volume	30	
Dec. 5	FINAL EXAM 1 – 3 P.M.		

**SYLLABUS REVISIONS:** The instructor reserves the right to revise any part of this syllabus as deemed necessary throughout the semester. Revision, if necessary, will be announced during class.