

University of North Texas at Dallas
Fall 2012
SYLLABUS

MATH 4050 (Advanced Study of the Secondary Mathematics Curriculum) (3Hrs)	
Department of	Mathematics and Information Sciences
Division of	Liberal Arts and Sciences
Instructor Name:	Dr. Ali Shaqlaih
Office Location:	Founders' Hall 227
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Email Address:	ali.shaqlaih@unt.edu
Office Hours:	Office: MTWR:10:00-10:50 AM , 1:00:1:50PM, Lab: R: 4:00-4:50PM
Classroom Location and Time:	DAL2-241, TR:2:00-3:20PM
Course Catalog Description:	The purpose of this course is to extend your knowledge about the fundamental mathematical structures present in the high school Mathematics curriculum. To this end, we will engage in a deep analysis (involving technology as applicable) of some topics such as Real and Complex numbers, Functions, equations, Combinatorics, The Euclidean algorithm, Congruence classes, Prime factorization, Probability and Mathematical modeling. We will cover some Pedagogical techniques if time permits. While the topics may seem elementary, the approach we will take is certainly advanced. The goal is that you will develop a profound understanding of the topics you will be teaching in your future classrooms. The structure of the course will be based on Texas and CCRS standards.
Prerequisites:	MATH 2100 and either MATH 3510 or MATH 3610.
Required Text:	<ul style="list-style-type: none"> • Usiskin, Peressini, Marchisotto, & Stanley. (2003). <i>Mathematics for High School Teachers: An Advanced Perspective</i>. Upper Saddle River, New Jersey; Prentice Hall. ISBN: 0-13-044941-5 • Functions in Mathematics: Introductory Explorations for Secondary School Teachers by Mark Daniels and Efraim P Armendariz. ISBN: 978-1-60927-168-8 • Class notes and all the handouts distributed by the instructor in this class are as important as the textbook.
Recommended Texts and References:	<ul style="list-style-type: none"> • Bremigan E., Bremigan R., Lorch J. (2011). <i>Mathematics for secondary school teachers</i>. MAA. ISBN: 978-0-88385-773-1 • Charlene E. Beckmann, Denisse Rubilee Thompson, Rheta N., Rubenstein (2009) <i>Teaching and Learning High School Mathematics</i>. ISBN 978-0-470-45450-3 • Sultan A., Artzt A. (2011). <i>The Mathematics that every secondary school teacher needs to know</i>. Routledge. ISBN: 13-978-0-415-99413-2
Access to Learning Resources:	UNT Dallas Library: phone: (972) 780-3625; web: http://www.unt.edu/unt-dallas/library.htm UNT Dallas Bookstore: phone: (972) 780-3652; e-mail: 1012mgr@fhcg.follett.com

Course Goals	
	<p>The goal of this course is to:</p> <ul style="list-style-type: none"> • Study high school Mathematics from a deeper level. • Make connections between different topics in Mathematics. • Make connections between the high school Mathematics and the college curriculum. • Demonstrate alternative approaches to solving mathematical problems. • Apply Mathematics in a variety of settings. • Demonstrate an understanding of both national and state standards for high school students and teachers. • Learn proofs of many of the classical problems in secondary mathematics classes. • Discuss some modern methods in teaching some topics in high school. • Realize that teaching mathematics is much more than just showing people how to manipulate formulas and solve problems.
Learning Objectives/Outcomes:	
	<p>At the end of this course, the student will be able to:</p> <ul style="list-style-type: none"> • Demonstrate ability to apply the following concepts from an advanced standpoint to the teaching of Mathematics in secondary schools: real and complex numbers, real function, solving equations, integers and polynomials, geometry and combinatorics. • Demonstrate through written or visual/oral presentations, the ability to present high school Mathematics from advanced perspective. • Demonstrate comprehension of core mathematical concepts. • Execute mathematical procedures accurately, appropriately, and efficiently. • Apply principles of logic to develop and analyze conjectures and proofs. • Use various mathematical tools, including technology to represent, and solve problems.

Course Outline

Priority will be given to understanding the material in depth rather than covering more topics. This schedule is subject to change by the instructor. Any changes to this schedule will be announced in class. We will try to cover as much as we can from the following topics as time permits.

TOPICS	TIMELINE
Real Numbers and Complex Numbers	Weeks Sep.3, 10
Functions & Equations & Mathematical modeling	Weeks of Sep. 17, 24, Oct.1
Integers, polynomials & Number system structures	Weeks of Oct. 8, 15, 22, 29
Congruence	Weeks of Nov.5, 12
Area, Volume, Conic sections	Week of Nov.19, 26
Combinatorics & probability	Weeks of Dec.3

Course Evaluation

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Exams – Written in-class closed-book tests to measure knowledge of presented course material.

Portfolio- out of class work designed to supplement and reinforce course material.

Quizzes – Weekly quizzes to help students keep fresh with the material.

Projects- At least one group project to apply the material learnt in class.

Grading Matrix:

Instrument	Value	Total
Portfolio	Assignments, activities, presentations	100
Quizzes	7 quizzes at 20 points each	140
Hour Exams	2 exams at 150 points each	300
Projects	Group project	60
TExES practice Exam	One exam at 100 points	100
Final Exam	One comprehensive exam	300
Total:		1000

The following standard grading scale will be used to determine your final letter grade:

$100\% \geq A \geq 90\% > B \geq 80\% > C \geq 70\% > D \geq 60\% > F \geq 0.$

Technology Use Policy:

Using technology, when appropriate, is encouraged. We will be using TI 84 Calculator. You **cannot** use the TI-89 Calculator or any other calculator, which performs symbolic operations.

Portfolio Policy:

This is an outside of class work; you will carefully write a final version of the solution of each of the assigned problems and compile these in a single loose leaf notebook which you will periodically turn in to me to review. You should keep your portfolio up to date. I will ask for the portfolio to be submitted on regular basis (**no previous notice will be given**). Use of complete, correct English logical sentences is essential. All portfolio problems should be written in appropriate way and all work must be shown in details. Homework is essential for your full understanding of the course material. The assigned homework problems are the minimum number of problems required to attain some level of mastery of the material and you should work more problems to achieve full mastery of the material. You should do all homework problems but only selected problems will be graded. Make sure, to say exactly what you mean and to mean what you say. You will be able to make revisions to your portfolio as necessary, but in the end all problems must all be correct. Please be as neat as possible on the portfolio and try to keep the problems in order with enough space between them (it will be a good idea to put each problem in one page). Math gets harder the more unorganized you work! Portfolio will be collected without prior notice to be graded so you need to be ready and up to date. Portfolio grade includes the written part, participation, presentations and activities in class.

Projects Policy:

Each student will be asked to participate in activities such as writing papers about some topics related to teaching high school mathematics, presenting solutions to certain problems or teaching demonstrations. Some of these projects will be in group settings. Topics and due dates will be announced in class.

Quizzes policy:

There will be 10 quizzes throughout the course. At the end of the semester, each student's best 7 quizzes will be added to get a 140 possible-point total. The quizzes will be given in the first 15 minutes of the class. There will be no make-ups for missed quizzes for any reason. The material that will be covered in the quizzes will be announced a head of time.

Exams Policy:

Exams should be taken as scheduled in the class time. All exams are closed book exams. No makeup examinations will be allowed except for documented emergencies (See Student Handbook). The material that will be covered in the exams will be announced in class and the final exam will be comprehensive.

TEExES Practice Exam Policy:

You must take the practice TEExES exam during the semester. Online registration is required and the exam will be offered on Oct. 19 from 12:00-5:00pm and Oct. 20 from 9:00am-2:00pm.

Make-up exam policy:

All requests for make-up exams **MUST** be submitted to the instructor in writing, with the supported documents. It is imperative that you contact your instructor as soon as possible (do **NOT** wait until you return to class!) and include a way that you can be reached.

General Policies:

- The first and most fundamental expectation I have for everyone in the class is to respect one
- another. Among other things, this means that only one person speaks at a time, **no one works on anything not related to the class (no cell use, no texting, no reading, no sleeping,...)** and everyone will put forth an honest effort.
- It is the student's responsibility to stay abreast of all class announcements and changes made to this syllabus in class, whether present or not.
- Leaving and entering the class back is **not allowed**. You can leave the class if you are not returning or for real emergency case. Leaving the class should be by the permission of the instructor.
- You are expected to review all graded quizzes, homework and exam papers as soon as they are returned. All questions about the grading of quizzes, homework or exam papers must be reported within **seven** calendar days of the date on which the paper was returned.
- To do well in this course, attend class every meeting on time, be prepared to work for the full class time, bring all necessary materials to class, participate as much as possible, do the homework and extra problems steadily every day rather than once a week. Don't be afraid to make mistakes or ask questions, the more you get involved, the better you'll do!
- **My door will always be open and you should feel free to e-mail me if you have questions.** Don't stress out about math! You have the abilities to do very well as long as you work hard.

Students with Disabilities (ADA Compliance):

The University of North Texas Dallas faculty is committed to complying with the Americans with Disabilities Act (ADA). Students' with documented disabilities are responsible for informing faculty of their needs for reasonable accommodations and providing written authorized documentation. For more information, you may visit the Office of Disability Accommodation/Student Development Office, Suite 115 or call Laura Smith at 972-780-3632.

Student Evaluation of Teaching Effectiveness Policy:

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class.

Bad Weather Policy:

On those days that present severe weather and driving conditions, a decision may be made to close the campus. In case of inclement weather, call UNT Dallas Campuses main voicemail number (972) 780-3600 or search postings on the campus website www.unt.edu/dallas. Students are encouraged to update their Eagle Alert contact information, so they will receive this information automatically.

Attendance and Participation Policy:

The University attendance policy is in effect for this course. Class attendance and participation is expected because the class is designed as a shared learning experience and because essential information not in the textbook will be discussed in class. The dynamic and intensive nature of this course makes it impossible for students to make-up or to receive credit for missed classes. Attendance and participation in all class meetings is essential to the integration of course material and your ability to demonstrate proficiency. Coming to class late or leaving *it* early is considered an absence. Students are responsible to notify the instructor if they are missing class and for what reason. Students are also responsible to make up any work covered in class. It is recommended that each student coordinate with a student colleague to obtain a copy of the class notes, if they are absent.

Academic Integrity:

Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to the Student Code of Academic Integrity at <http://www.unt.edu/unt-dallas/policies/Chapter%2007%20Student%20Affairs,%20Education,%20and%20Funding/7.002%20Code%20of%20Academic%20Integrity.pdf> for complete provisions of this code.

In addition, all academic work submitted for this class, including exams, papers, and written assignments should include the following statement:

On my honor, I have not given, nor received, nor witnessed any unauthorized assistance that violates the UNTD Academic Integrity Policy.

Diversity/Tolerance Policy:

Students are encouraged to contribute their perspectives and insights to class discussions. However, offensive & inappropriate language (swearing) and remarks offensive to others of particular nationalities, ethnic groups, sexual preferences, religious groups, genders, or other ascribed statuses will not be tolerated. Disruptions which violate the Code of Student Conduct will be referred to the Center for Student Rights and Responsibilities as the instructor deems appropriate.

Important dates:

Quiz 1	Sep.6
Quiz 2	Sep. 13
Quiz3	Sep.20
Quiz 4	Sep.27
First Hour Exam	Oct. 4
Last day to withdraw with an automatic W	Oct. 9
Quiz 5	Oct.11
Quiz 6	Oct.18
TEExES Practice Exam	Oct. 19 (12:00-5:00pm)
TEExES Practice Exam	Oct. 20 (9:00am-2:00pm)
Quiz 7	Oct.25
Quiz 8	Nov. 1
Last day to drop with W or WF	Nov. 7
Quiz 9	Nov. 8
Second hour exam	Nov. 15
Quiz10	Nov. 29
Final exam	Dec 11 at 2:00 PM