

**University of North Texas at Dallas**  
**Fall 2010**  
**SYLLABUS**

<b>MATH 4050 (Advanced Study of the Secondary Mathematics Curriculum) (3Hrs)</b>	
<b>Department of</b>	Mathematics and Information Sciences
<b>Division of</b>	Liberal Arts and Sciences
<b>Instructor Name:</b>	Dr. Ali Shaqlaih
<b>Office Location:</b>	Building 2, Room 227
<b>Office Phone:</b>	972-338-1569
<b>Email Address:</b>	ali.shaqlaih@unt.edu
<b>Office Hours:</b>	T, R: 10:00-11:00am , 2:00-5:00pm, W: 9:00-10:00
<b>Classroom Location:</b>	DAL1 308
<b>Class Meeting Times:</b>	T, R: 5:30-6:50 pm
<b>Course Catalog Description:</b>	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, 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 the NCTM standards.
<b>Prerequisites:</b>	MATH 2100 and either MATH 3510 or MATH 3610.
<b>Required Text:</b>	<ul style="list-style-type: none"> <li>• Usiskin, Peressini, Marchisotto, &amp; Stanley. (2003). <i>Mathematics for High School Teachers: An Advanced Perspective</i>. Upper Saddle River, New Jersey; Prentice Hall. ISBN: 0-13-044941-5</li> <li>• Class notes and all the handouts distributed by the instructor in this class are as important as the textbook.</li> </ul>
<b>Recommended Texts and References:</b>	<ul style="list-style-type: none"> <li>• James W. Stigler and James Hiebert (1999). <i>The Teaching Gap</i>. New York; The Free Press. ISBN: 978-1-4391-4313-1.</li> <li>• Charlene E. Beckmann, Denisse Rubilee Thompson, Rheta N., Rubenstein (2009) <i>Teaching and Learning High School Mathematics</i>. ISBN 978-0-470-45450-3.</li> <li>• National Council of Teacher of Mathematics web, <a href="http://nctm.org/">http://nctm.org/</a></li> </ul>
<b>Access to Learning Resources:</b>	UNT Dallas Library: phone: (972) 780-3625; web: <a href="http://www.unt.edu/unt-dallas/library.htm">http://www.unt.edu/unt-dallas/library.htm</a> UNT Dallas Bookstore: phone: (972) 780-3652; e-mail: <a href="mailto:1012mgr@fhg.follett.com">1012mgr@fhg.follett.com</a>

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

### 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.

<b>Chapter #</b>	<b>TOPICS</b>	<b>TIMELINE</b>
Chapters 1	What is Meant by "An Advanced Perspective"	Week of Aug.30
Chapter 2	Real Numbers and Complex Numbers	Weeks of Sep.6, 13
Chapter 3	Functions	Weeks of Sep. 20
Chapter 4	Equations	Week of Sep.27
Chapter 5	Integers and polynomials	Weeks of Oct.4, 11
Chapter 6	Number system structures	Weeks of Oct.18, 25
Chapter 7	Congruence	Weeks of Nov.1, 8
Chapter 10	Area, Volume, Conic sections	Week of Nov.15
Hand out	Combinatorics	Weeks of Nov.22, 29
Hand out	Mathematical modeling with differential equations	Week of Dec.6

### 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.

**Homework** – Written assignments designed to supplement and reinforce course material.

**Papers** – Written papers to stress some Pedagogical issues.

**Participation**- Class participation to ensure effective and cooperative learning.

**Quizzes** – Weekly quizzes to help student keep with the material.

**Grading Matrix:**

<b>Instrument</b>	<b>Value</b>	<b>Total</b>
Homework Assignments	3 Hws at 15 points each	40
Quizzes	7 quizzes at 15 points each	100
Hour Exams	2 exams at 100 points each	200
Papers	Two papers at 20 points each	40
Participation	Participation at 20 points	20
Final Exam	One comprehensive exam	200
Total:		600

**Grade Determination:**

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

**A = 90% or better, B = 80 – 89 %, C = 70 – 79 %, D = 60 – 69 %, F = less than 60%.**

**Technology Use Policy:**

Using technology, when appropriate, is encouraged. We will be using TI 84 Calculator and Mathematica in some topics such as functions and equations. You **cannot** use the TI-89 Calculator or any other calculator, which performs symbolic operations.

**Homework Policy:**

Homework will be into two parts, one that is for practice that student doesn't need to turn in and another part that is to be handed in at the beginning of the class on the due date. Homework should be written in appropriate way and all work must be shown in details. 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 from each homework will be graded. Please be as neat as possible on the homework and try to keep the problems in order with space between them. Your homework should have your name and date clearly marked in the top right corner of the outside page (if there is more than one sheet of paper, please staple the sheets). Late homework will **NOT** be accepted.

**Papers Policy:**

Each student will be asked to submit two papers throughout the semester about some topics that will be announced later. A 3-4 page write-up is required for each paper assignment and will be turned in at the beginning of the class on the day it is due. This write-up needs to be typed, double-spaced, 3-4-page long with one-inch borders in 12 point times or courier font. Your submitted paper should show a reasonable summary of the reading, should highlights three things you've learned from the reading and should have your reaction to the reading. Late papers will **NOT** be accepted.

**Quizzes policy:**

There will be 11 quizzes throughout the course. At the end of the semester, each student's best 7 quizzes will be added to get a 105 possible-point total (will be counted as a total 100). 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.

**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 & Procedures:**

- 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 uses cell phones in class, no one works on anything not related to our class, 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.
- You are expected to review all graded quizzes 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.
- You are fully responsible for the material covered in class either from the text or not.
- Do the homework and extra problems steadily every day rather than once a week. Do not fall behind. To catch up, if class is missed, contact the instructor by e-mail.
- This class will be very active and I expect you to participate as much as possible. Don't be afraid to make mistakes or ask questions, the more you get involved, the better you'll do!
- This course requires you to learn a fair amount of new mathematical vocabulary. Understanding the vocabulary is essential for you to read questions correctly and express your thoughts, ideas and answers using the proper terminology.
- To do well in this course attend class every meeting on time, be prepared to work for the full class time, be organized, bring all necessary materials to class and follow teacher directions.
- If you need help, please ask for it. My door will always be open and you may feel free to e-mail me if you have questions outside of school time.
- 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.

**Academic Integrity:**

Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of conduct and Academic Dishonesty 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 Conduct at [http://www.unt.edu/csrr/student\\_conduct/index.html](http://www.unt.edu/csrr/student_conduct/index.html) for complete provisions of this code.

**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](http://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.

**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.2
Quiz 2	Sep. 9
Quiz 3	Sep.16
Quiz 4, Hw 1 due	Sep.23
<b>First hour exam</b>	<b>Sep.30</b>
<b>Last day to withdraw with an automatic W</b>	<b>Oct. 5</b>
Quiz 5	Oct.7
Quiz 6, First paper due	Oct.14
Quiz 7	Oct.21
Quiz 8	Oct.28
<b>Last day to drop with W or WF</b>	<b>Oct. 29</b>
Quiz 9, Second paper due	Nov.4
Quiz 10, Hw 2 due	Nov.11
<b>Second hour exam</b>	<b>Nov. 18</b>
Quiz 11, Hw 3 due	Dec. 2
<b>Final exam</b>	<b>Dec 14 at 4:30 pm</b>