

**University of North Texas at Dallas**  
**Fall 2016**  
**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 Phone:</b>	972-338-1569		
<b>Email Address:</b>	ali.shaqlaih@untDallas.edu		
<b>Office Hours:</b>	Founders' Hall 227: TR:8:00-9:50 am,		
<b>Classroom Location and Time:</b>	Founders' Hall-243, W:11:30am-12:50pm		
<b>Course Catalog Description:</b>	<p>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.</p>		
<b>Prerequisites:</b>	MATH 2000 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>• Bremigan E., Bremigan R., Lorch J. (2011). <i>Mathematics for secondary school teachers</i>. MAA. ISBN: 978-0-88385-773-1</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>• 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</li> </ul>		
<b>Access to Learning Resources:</b>	<p>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@fhq.follett.com">1012mgr@fhq.follett.com</a></p>		

<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>TOPICS</b>	<b>TIMELINE</b>
Real Numbers, Complex Numbers, Functions, Equations & Mathematical modeling	Month of Sep.
Congruence & Number system structures	Month of Oct.
Pedagogy	November
Project presentations	December

### 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.

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

**Grading Matrix:**

<b>Instrument</b>	<b>Value</b>	<b>Total</b>
Hour Exams	One midterm	300
Projects	Group project	300
Final Exam	One comprehensive exam	400
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.

**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.

**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:**

- 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 generally **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.
- You will **NOT** get better than a grade of C if you miss **more than 5 classes**. Missing more than 5 classes may result in being dropped from the course with a WF.
- 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](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. **More than 5 classes of absence may result in being dropped from**

**the course with a WF. A student may NOT get better than a grade of C if he/she misses more than 5 classes.**

**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\\_Integrity.pdf](http://www.unt.edu/unt-dallas/policies/Chapter%2007%20Student%20Affairs,%20Education,%20and%20Funding/7.002%20Code%20of%20Academic_Integrity.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.**

**Copyright Policy:**

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this course, which include but are not limited to syllabi, lecture notes, quizzes, exams, in-class materials, review sheets, projects, and problems sets. Because these materials are copyrighted, you do not have the right to copy and distribute the handouts, unless I expressly grant permission.

**Classroom Etiquette:**

Appropriate behavior is expected of all students taking this course.

- Arrive to class promptly and do not leave until the scheduled ending time of the class.
- If you must arrive late or leave early, please do so as discreetly as possible and take a seat near the door.
- Turn off all non-medical electronic devices such as pagers, cell phones, laptops, etc. Take off the headphones.
- Do not read newspaper or work on unrelated assignments during class.

**Grade Assignment:**

- The student course grade is assigned according to the evaluation criteria and grading assignment stated on this syllabus.
- The grade is completely objective and is determined solely by student performance on each of the evaluation criteria (in-term exams, in-class quizzes, on-line quizzes, and the final exam).
- **Do not expect extra credit work or bonus grade assignments.**

**Student Behavior:**

- Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT.
- Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Student Life Center to consider whether the student's conduct violated the Code of Student Conduct.

- The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at [http://dallas.unt.edu/sites/default/files/page\\_level2/pdf/policy/7.001%20Code%20of%20Student%20Rights%20Responsibilities%20and%20Conduct.pdf](http://dallas.unt.edu/sites/default/files/page_level2/pdf/policy/7.001%20Code%20of%20Student%20Rights%20Responsibilities%20and%20Conduct.pdf)

**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.