

**University of North Texas at Dallas**  
**Fall 2014**  
**SYLLABUS**

<b>MATH 5001 (Teaching Dual Credit Mathematics) (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>	Founders' Hall 227
<b>Office Phone:</b>	972-338-1569
<b>Email Address:</b>	ali.shaqlaih@unt.edu
<b>Office Hours:</b>	MW:8:30-9:50 am, 1:00:2:20 pm,
<b>Classroom Location and Time:</b>	M: 4:30-7:20PM in DAL2-339
<b>Course Catalog Description:</b>	The purpose of this course is to extend your knowledge about the fundamental mathematical structures present in teaching dual credit mathematics courses. To this end, we will engage in a deep analysis of math and education topics such as course planning and course syllabus, the preparation and mechanics of lectures and problem solving sessions, models of instruction including problem based learning, the preparation, administration and grading of examinations, the mathematical foundations of secondary and dual credit curricula; review of the undergraduate mathematics curriculum. The goal is that you will develop a profound understanding of the topics you will be teaching in your future classrooms.
<b>Prerequisites:</b>	Admission to M. Ed. Program or consent of instructor
<b>Texts</b>	<ul style="list-style-type: none"> <li>• Basic Analysis, Introduction to Real Analysis by Jiří Lebl. (<b>Available for free</b>)</li> <li>• Kelton, S. An Introduction to Teaching Mathematics at the College Level. Notes, (<b>Available for free</b>)</li> <li>• Steven G. Krantz, How to Teach Mathematics, 2<sup>nd</sup> ed. AMS book</li> <li>• Bremigan E., Bremigan R., Lorch J. (2011). <i>Mathematics for secondary school Teachers</i>. MAA. ISBN: 978-0-88385-773-1</li> <li>• Sriraman, B. English, L., (2010). Theories of Mathematics Education,</li> <li>• Class notes and all the handouts distributed by the instructor Min this class are as important as the textbook.</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@fheg.follett.com">1012mgr@fheg.follett.com</a>

## Course Goals

**The goal of this course is to:**

- Study dual credit Mathematics curriculum 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.
- Acquire nationally acceptable graduate level of mathematical maturity.

## Learning Objectives/Outcomes:

**At the end of this course, the student will be able to:**

- 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 dual credit 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.

Meeting date	Read before class	In class	Assignments due
August 25 <sup>th</sup>	None	Introduction to the course Introduction to the teaching and content of dual credit math Introduction to set theory	None
Sep. 8	Teaching Mathematics at the college level, Kelton	Discussion,  Basic analysis	HW1
Sep.15	Action research project example	Teaching college math Designing a course, writing a syllabus Problem based learning Basic analysis	College level Syllabus
Sep.22	An introduction to teaching mathematics at the college level, Kelton Problem based learning, Barell	Models of teaching mathematics Problem based learning Basic analysis	HW2
Sep. 29	Work on the action research project	Action research project Models of teaching math Problem based learning	

		Basic analysis	
Oct.6	An introduction to teaching mathematics at the college level, Kelton  Action research project example	Managing large lectures Managing discussion sections Managing group work Action research project discussion Technology in teaching math Basic analysis	Problem based unit
Oct.13	Review the math and reading for the test	Midterm	
Oct.20	An introduction to teaching mathematics at the college level, Kelton  How to teach mathematics, Steven G. Krantz	Managing large lectures Managing discussion sections Managing group work Technology in teaching math Basic analysis	
Oct.27	How to teach mathematics, Steven G. Krantz	Managing large lectures Managing discussion sections Managing group work Technology in teaching math Basic analysis	
Nov.3	An introduction to teaching mathematics at the college level, Kelton	Overview of content of dual credit courses Basic analysis	
Nov.10		Assessment in teaching mathematics the preparation, administration and grading of examinations Designing exams and quizzes Basic analysis	
Nov.17	Work on the project	Giving a talk Growing as a teacher Professional development	
Nov.24	Work on the project	Action research projects presentations	Projects due
Dec.1		Action research projects presentation	
Dec. 8		Final Exam	

### Grading Matrix:

Instrument	Value	Total
Homework		20%
Action research project		25%
Midterm		25%
Final exam		30%

The following standard grading scale will be used to determine your final letter grade:  
 $100\% \geq A \geq 90\% > B \geq 80\% > C \geq 70\% > D \geq 60\% > F \geq 0.$

## Action Research Project

Each group of students (up to 3) will complete one action research project on a math topic at the dual credit math level. The action research project will include the following components:

1. Identification of the problem:
  - Choose a topic or a concepts that the students are having difficulty in. What difficulty are the students having? What assessment data exist to document that the problem exists?
2. Identification of the goal:
  - State your measurable objectives clearly.
  - Give specific examples of mathematics problems/concepts (from sample STAAR tests, textbooks, literature, etc.) that students need to be able to solve/do.
3. Literature review:
  - Read and summarize at least two articles from well-respected journals that are related to your topic.
4. Change in instruction:
  - Describe in detail the method of instruction that has been used and then how you will change your instruction to better meet the students' needs, then, implement this change. Include all details of models of teaching (possibly problem based learning model), use of technology, teaching materials, units/lesson plans, assessments, research questions, hypothesis,...
5. Analysis and results:
  - Describe and document the degree of success in the change in instruction. What evidence is there that the change did or did not produce results?
6. Conclusion and recommendations:
  - State your conclusion and recommendation based on your results.

### Assessment of Action Research Project:

Each group will complete both of the following:

- A paper (10-12 typed pages, double space, APA style) that describe all six parts of the project.
- A 20 minute presentation to the class.

### Homework Policy:

This is an outside of class work; you will carefully write a final version of the solution of each of the assigned problems. 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. Please be as neat as possible 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!

**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.

**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%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.**

### **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.

### **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.