

# University of West Georgia

MATH 3805: Functions and Modeling

Spring 2016

Course Syllabus

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**Office:** 322 Boyd Building

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**Class Location:** 228 Humanities Academic Bldg. **Class Meeting:** M/W 3:30–4:50 p.m.

**Office Hours:** M/W/F 10–12; M/W 2:00–3:30

## **Catalog Description:**

This mathematics course is designed to address the unique needs of future teachers of mathematics. It is required of UTEACH mathematics majors and also counts toward their mathematics degree. In the course, students engage in explorations and lab activities designed to strengthen and expand their knowledge of the topics found in secondary mathematics.

## **University Policy:**

Please carefully read and review the important information at the following link: [http://www.westga.edu/assetsDept/vpaa/Common\\_Language\\_for\\_Course\\_Syllabi.pdf](http://www.westga.edu/assetsDept/vpaa/Common_Language_for_Course_Syllabi.pdf). This link contains material pertaining to your rights and responsibilities as a student in this class. Because these statements are updated as federal, state, university, and accreditation standards change, please carefully review the information each semester.

## **Ancillary Textbooks:**

Armendariz, E., & Daniels, M. (2012). *Functions in mathematics: Introductory foundations for secondary school teachers*. San Diego, CA: Cognella Publishing.

Giordano, F. R., Weir, M. D., & Horton, S. B. (2003). *A first course in mathematical modeling* (5th ed.). Pacific Grove, CA: Brooks Cole.

## **Student Learning Outcomes:**

In this course, mathematics teacher candidates should be able to do the following:

- Demonstrate proficiency in working with function related topics and mathematical modeling.
- Broaden their understanding of secondary mathematics content knowledge.
- Strengthen connections between college mathematics and secondary school mathematics.
- Make connections between secondary school mathematics and other content areas.
- Exhibit proficiency in using technology in the mathematics classroom.
- Present mathematical ideas and topics in a knowledgeable and effective manner.
- Become efficient seekers of mathematics content knowledge.
- Establish personalized reform-based visions for teaching secondary mathematics aligned with the Common Core State Standards for Mathematics.

## **Attendance Policy:**

It is my expectation that students will attend every class session and be punctual. Class participation entails being an active participant during the teaching and learning process. In the event of an absence, students are expected to get the materials and information relevant to the missed class from their peers. There are only 4 unexcused and excused absences allowed during the semester. If you exceed 4 absences, then you will fail the course. Please note that is your responsibility to sign the attendance sheet during each class period.

**Evaluation Techniques:**

Homework : 10%	ASK Papers: 10%	MATH Day Competition: 10%
Midterm Project: 10%	Midterm Exam: 25%	Final Project: 10%
Final Exam: 25%		

**Information about Course Assignments:**Homework

Each mathematics teacher candidate will complete the daily homework problems and place them in a homework folder. Homework folders will be turned in on examination days.

ASK Papers

Each mathematics teacher candidate will complete five ASK papers. These papers are designed to delve deeper into the mathematics at the secondary and undergraduate levels. ASK papers must be a full double-spaced page for full credit to be awarded.

MATH Day Mathematics Competition

Please sign up to participate in the Undergraduate Mathematics Competition during our annual UWG MATH Day.

Midterm Project

Each group will prepare an innovative 25 minute midterm presentation. More information concerning the midterm project will be posted in CourseDen.

Midterm Examination

The midterm examination will consist of a **cumulative** assessment of the concepts covered throughout the first portion of the semester.

Final Project

Each mathematics teacher candidate will complete a final project. A rubric concerning specific information about this assignment will be posted in CourseDen.

Final Examination

The final examination will consist of a **cumulative** assessment of the concepts covered throughout the entire semester.

**No Class Dates:**

Please note that there will be no class on Monday, January 18<sup>th</sup> in observance of the Dr. Martin Luther King Jr. Holiday, and there will be no class on Wednesday, March 30<sup>th</sup> in observance of UWG's Honors Convocation.

**Due Dates:**

- The midterm presentations are scheduled for Monday, March 21<sup>st</sup> and Wednesday, March 23<sup>rd</sup>.
- MATH Day is scheduled for Friday, February 26<sup>th</sup>.
- The final project is due on Monday, April 11<sup>th</sup>.
- The final exam is scheduled for Wednesday, April 27<sup>th</sup> from 2:00 p.m.–4:30 p.m.

**Class Policies and Procedures:**

1. All course assignments will be uploaded to CourseDen.
2. There will be no make up for the midterm presentation. Failure to present on your scheduled date will result in a grade of zero.

3. Late work is accepted with a 50% penalty for one late assignment. Please note that only one assignment can be submitted late. Other late submissions above the allotted one will result in a grade of zero.
4. If a student must miss the midterm exam and has excused documentation, then the final examination will be used for the missed test in the calculation of the final course grade.
5. Calculators can be used during examinations; however, cell phones may not be used (even as calculators).
6. In an effort to respect the learning process, please be sure that cellular phones are placed on vibrate or silent during class time.
7. Cheating is not tolerated. If a student is caught cheating, then the student will receive a zero for the test or assignment and will be reported for academic dishonesty.
8. Grades cannot be sent via e-mail to students. Students are expected to keep accurate records and ascertain where they stand in the course.
9. The daily schedule is included on the back of this page. Please note that this daily schedule is tentative. Changes might be made based on students' needs, inclement weather changes, etc.
10. Conferences can be beneficial and are encouraged. All conferences should occur during office hours.
11. Office hours will not be kept during final exam week. If a meeting is necessary during the final exam week, then please schedule an appointment.

#### **Course Readings:**

- Boaler, J. (1998). Open and closed mathematics: Student experiences and understandings. *Journal for Research in Mathematics Education*, 29(1), 41–62.
- Eisenberg, T. (2014). Some of my pet-peeves with mathematics education. In Fried, M. N., & Dreyfus, T. (Eds.), *Mathematics & mathematics education: Searching for common ground* (pp. 35–44). New York, NY: Springer.
- Freire, P. (2005). *Pedagogy of the Oppressed* (pp. 71–86). New York, NY: Continuum.
- Hung, M. (2015). Talking circles promote equitable discourse: A structured discussion format disrupts patterns of stratified talk and facilitates broader participation. *Mathematics Teacher*, 109(4), 256–260.
- Jett, C. C., Stinson, D. W., & Williams, B. A. (2015). Communities for *and* with Black male students. *Mathematics Teacher*, 109(4), 284–289.
- Karp, K. S., Bush, S. B., & Dougherty, B. J. (2015). 12 math rules that expire in the middle grades. *Mathematics Teaching in the Middle School*, 21(4), 208–215.
- Ronau, R., Meyer, D., Crites, T., & Dougherty, B. (2014). *Putting essential understanding of functions into practice in grades 9–12* (pp. 11 – 26). Reston, VA: National Council of Teachers of Mathematics.
- Wu, H. (2011). The mis-education of mathematics teachers. *Notices of the AMS*, 58(3), 372–384.

#### **Professional Resources:**

- Gutstein, E. R., & Peterson, B. (2013). *Rethinking mathematics: Teaching social justice by the numbers*, (2nd ed.). Milwaukee, WI: Rethinking Schools.
- National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: National Council of Teachers of Mathematics.
- Posamentier, A.S., Smith, B. S., & Stepelman, J. S. (2009). *Teaching secondary mathematics: Techniques and enrichment units*, 8th ed. Boston, MA: Pearson.
- Silver, H. F., Brunsting, J. R., Walsh, T., & Thomas, E. J. (2012). *Math tools grades 3–12*, 2nd ed. Thousand Oaks, CA: Corwin.

## Daily Schedule: Spring 2016

Date	Learning Objective
January 11 <sup>th</sup>	Introduction to Functions and Modeling
January 13 <sup>th</sup>	Functions
January 18 <sup>th</sup>	<b>MLK Jr. Holiday: No Class</b>
January 20 <sup>th</sup>	Modeling
January 25 <sup>th</sup>	Functions & Relations
January 27 <sup>th</sup>	Rate of Change
February 1 <sup>st</sup>	Graphs of Functions
February 3 <sup>rd</sup>	Problem Solving I
February 8 <sup>th</sup>	Counting Principles
February 10 <sup>th</sup>	Trigonometric Functions
February 15 <sup>th</sup>	Matrices
February 17 <sup>th</sup>	Quadratic Functions
February 22 <sup>nd</sup>	<b>Professor @ Conference: Online Class/SI Leader</b>
February 24 <sup>th</sup>	Problem Solving II
February 26 <sup>th</sup>	<b>UWG's Mathematics Department's Annual MATH DAY<sup>1</sup></b>
February 29 <sup>th</sup>	Logarithmic & Exponential Functions
March 2 <sup>nd</sup>	Review
March 7 <sup>th</sup>	Midterm Examination
March 9 <sup>th</sup>	Midterm Meeting Day
March 14 <sup>th</sup>	<b>Spring Break: No Class</b>
March 16 <sup>th</sup>	<b>Spring Break: No Class</b>
March 21 <sup>st</sup>	Midterm Project Presentations
March 23 <sup>rd</sup>	Midterm Project Presentations
March 28 <sup>th</sup>	Mathematical Misconceptions
March 30 <sup>th</sup>	<b>UWG's Honors Convocation: No Class</b>
April 4 <sup>th</sup>	Calculus Functions
April 6 <sup>th</sup>	Technology Day
April 11 <sup>th</sup>	<b>Professor @ Conference: Online Class/SI Leader</b>
April 13 <sup>th</sup>	Problem Solving III
April 18 <sup>th</sup>	GACE/MAA/NCTM
April 20 <sup>th</sup>	Review for Final Examination
April 27 <sup>th</sup>	<b><i>Final Examination: 2:00 p.m. – 4:30 p.m.</i></b>

<sup>1</sup> As mentioned on the previous page, MATH Day is on a Friday. Please place this date on your calendar and make arrangements to be present for this important day.