MATH 3303: Functions and Modeling, Section 001
Syllabus

Instructor Contact Information

Instructors: Dr. John Paul Cook and Dr. Michael A. Tallman
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Office Hours (Dr. Cook): Monday and Friday, 10:30 AM - 11:30 AM; Thursday, 2:00 PM - 3:00 PM
Office Hours (Dr. Tallman): Friday, 3:30 PM - 5:30 PM in MS 417

Class & Resource Information

Class Meeting: Tuesday and Thursday, 12:30 PM - 1:45 PM
Class Location: Physical Sciences 108
D2L (Online Classroom): https://oc.okstate.edu/ (Chrome, Firefox, or Safari work best)

Prerequisites: Calculus II (Math 2153).

Required Materials:
There is no required textbook for this class. The instructors will distribute in-class activities and will post assignments on D2L frequently throughout the semester. You should therefore make a habit of checking D2L several times throughout the week. The following materials are required:
(1) Download and install *Graphing Calculator*, Version 4.0 by Pacific Tech (available at https://www.pacifict.com/Order.html)
(2) Download and install *Geometer's Sketchpad*, by McGraw Hill Education (available at https://www.mheonline.com/program/view/2/16/2647/00000SPAD) **OR** *Geogebra* (available at https://www.geogebra.org/download)

Calculators: TI 83 and 84 models are permitted for all exams. The following devices are ***not allowed*** on exams: TI 89, TI Nspire, any calculator with a computer algebra system, any technology with wireless or Internet capability (i.e. laptops, tablets, smart phones or watches), a QWERTY keyboard, and any type of camera. If you do not own an allowable calculator, you may borrow a calculator for the semester from the Math Department office without charge. Graphing calculators can be a valuable tool, but not a substitute for your own conceptual understanding.

Course Information

This course provides a conceptually rigorous treatment of the central ideas of secondary mathematics. Much of the mathematical content in this course will seem familiar by *topic name*, but it will be explored and developed from a very different perspective. The focus will be on *constructing meaning* for concepts and on building *coherence of meaning* across concepts and various representations of them. The immediate aims of the course are that you significantly deepen your understanding of core ideas in the high school mathematics curriculum, and that you come to see them as being conceptually coherent and providing a foundation for a host of other seemingly disconnected concepts. The long-term aim is to support your ongoing efforts to develop an orientation to know and teach high school mathematics for understanding—a core feature of the teacher certification track of the mathematics major. As such, course activities and assessments (class activities, homework assignments, exams) will reflect these expectations: they will focus on both doing high school mathematics with meaning and on expressing and communicating that meaning accurately and coherently in verbal and written form.

The primary purpose of this course is to develop the following competencies:
(1) Mathematical content knowledge for teaching secondary mathematics
(2) Problem solving abilities, including the mathematical practices described in the *Common Core Mathematics Standards*.
(3) Understanding of the process of learning key ideas of secondary mathematics, including but not limited to ideas of quantity, rate of change, proportionality, function, linearity, exponential growth, trigonometric functions.
(4) Connections among major ideas of secondary algebra, precalculus, and calculus.
(5) Ability to construct mathematical arguments and communicate them both verbally and in writing.
(6) Ability to apply mathematical content knowledge to the problems of teaching (e.g., instructional design, characterizing students' thinking).

Expectations: All students are expected to be active participants in class by asking and answering questions. During class, the use of cellphones, tablets, and laptops is prohibited since these can be distracting. Plan to spend between four and six hours each week outside of class on MATH 2144. This includes working on problems, discussing questions with others, and making use of office hours and the MLSC. Should you miss class, it is your responsibility for obtaining any handouts and finding out about any announcements or assignments you may have missed. For example, arrange to borrow a classmate's notes so that you can learn what was covered in class.

Missing Work Policy: Reasonable accommodation will be offered in the event that you miss a major assessment activity for a valid and documented reason, **assuming documentation is provided in advance** unless absolutely impossible. For a quiz or exam, you need to tell me as soon as you know there is a conflict and you will be ineligible for a make-up if you do not. If you cannot make it to class when a written assignment is due you should turn it in early or get a classmate to turn it in for you. Late assignments will not be accepted unless the student provides documentation of an extenuating circumstance prior to the due date.

Syllabus Attachment: Please read the OSU syllabus attachment on the web from the page: http://academicaffairs.okstate.edu/content/resources-faculty-staff and follow the link under Syllabus Attachment for Fall 2015. This has a lot of important information, including instructions about disability accommodations. Please contact me privately during the first week of the course if you need accommodations as the result of a disability. Any changes to this syllabus will be announced in class and posted on D2L.

Grades

The letter grade for the course depends upon your numerical weighted average, which is computed as follows:

Assignments:	30%
Midterm:	20%
Project:	20%
Participation:	5%
Final Exam:	25%

Each homework assignment is worth 10 points. Your final course grade will be a weighted average of your percent score on the course project, your percent scores on assignments, and your class participation:

Final Grade = 0.30 x Assignments% + 0.20 x Midterm% + 0.20 x Project% + 0.05 x Participation% + 0.25 x Final Exam%

Determination of Grades

$90\% \leq A \leq 100\%$

$80\% \leq B < 90\%$

$70\% \leq C < 80\%$

$60\% \leq D < 70\%$

$0\% \leq F < 60\%$

Homework

Types of Homework Assignments
Assignments will be of four types:
1. Solve mathematics problems and provide a written and verbal rationale for solutions.
2. Construct conceptual analyses that define the mental activity involved in understanding particular ideas from the secondary mathematics curriculum.
3. Write 1-2 page article reviews and/or reflections.
4. Design animations accompanied by task sequences to demonstrate attention to the development of particular mathematical meanings.

Course Project
You will identify one idea from the secondary mathematics curriculum that you did not understand well prior to taking this

course. You will describe what it means to understand this idea and what you conjecture are the connections that students need to make when learning this idea. You will develop a lesson that supports students' understanding of the idea you select. This lesson will consist of an in-class activity, homework assignment, and assessment. You will implement the in-class activity during class while your classmates participate as students. Your lesson will include detailed teacher notes that articulate the mathematical thinking and understandings the lesson seeks to promote.)

Group work
You will be working in groups during class and will be expected to: (1) exhibit sense-making and persistence when responding to an in-class task; (2) communicate your mathematical thinking and solutions to your classmates; (3) respond to the meanings expressed by your classmates; (4) exhibit mathematical integrity at all times—do not pretend to understand when you don't and only propose solutions that are meaningful to you; and (5) pose questions when explanations are not clear or coherent.

Exams
There will be one midterm exam and one comprehensive final exam. The midterm exam will be given in class.
> **Midterm Exam:** Thursday, October 15
> **Final Exam:** Thursday, December 10, 10:00 AM - 11:50 AM.

Academic Integrity & Drops
Academic Integrity: Oklahoma State University is committed to the maintenance of the highest standards of integrity and ethical conduct. Please see the OSU Fall 2015 Syllabus Attachment for more information. You are encouraged to work and study together, however **all written and online work you hand in must be your own**. Copying someone else's solutions, letting others copy your work is prohibited. Do not cheat. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript (F!), and being suspended from the University.

Drops: The last day to drop a class without a "W" is Monday, August 24th.