

MATH 140/141: Intensive Concepts and Processes I and II
2008-9: MWF 11:30-12:45 ACW 205

Dr. Debra Borkovitz

Activities 210 x2230, dborkovitz@wheelock.edu AOL IM: dborkovitz (I usually leave it off, but sometimes I'm available). Website (not the course website): <http://faculty.wheelock.edu/dborkovitz>. YouTube: <http://www.youtube.com/dborkovitz>.

Office Hours: By appointment or drop by. I am usually at Wheelock from 10:30-2:30 every day, and I will usually be in my office for an hour before and after class.

Course Description: Deepens understanding of Number and Operation; Algebraic Thinking; Geometry and Measurement; and Probability and Data Analysis. Emphasizes problem-solving, justifying reasoning, mathematical communication, representation, and mathematical connections. Intended primarily for prospective teachers. Two semester intensive version of the Concepts and Processes Sequence (Math 130/131/132), intended for well-prepared students. Meets three periods per week, with an additional required study group (led by peer tutor fall semester). Prerequisite: Passing Entry Exam. (Satisfies Core Requirement in Mathematics). Introductory.

Text/Materials: Bassarear, Tom, *Mathematics for Elementary School Teachers, 4/e*, Boston: Houghton Mifflin, 2008. The *Explorations Manual* is also required. You should bring the *Explorations Manual* with you to class. Manipulatives will be used extensively to model math concepts. You can borrow manipulatives from the Resource Center. The library (on reserve), study lounge, and Resource Center have copies of the texts that you can use there.

Course Website: Assignments will be posted on the course website, and we will also use the site for other purposes. You can access the Wheelock-CT system from the quick link on the Wheelock College Home Page. Your login is firstname.lastname (as in your Wheelock email, but without the @wheelock) and your initial password is your ID number (also on your ID card).

Technology: A scientific calculator is required, and you should bring it to class with you. Graphing calculators are recommended, but not required (if you don't use a graphing calculator, a calculator that can represent fractions -- such as the TI-30 or TI-32 -- is recommended.)

We will also be using Geometer's Sketchpad, Excel and other software throughout the course. No experience is assumed.

Course Goals:

1) Problem Solving: Someone once said that good mathematics students are the ones who "know what to do when they don't know what to do." In this course we will

learn various strategies for approaching mathematics problems, including what to do when you're stuck or when you're not sure how to start.

2) Communication: Mathematics has its own language, which often uses ordinary words in very specific ways. In this course you will have ample opportunity to communicate your mathematical ideas both orally and in writing and to improve your ability to read mathematics. Being required to communicate mathematics might be a new experience for you, but you will receive support and direction in improving this important and complicated skill.

3) Reasoning: How do you know whether your answer is correct in a math class? Do you usually wait for a teacher to tell you? If you do, what will you do when there is no teacher around? In this class you will learn to justify your thinking with answers that can “convince a skeptic.”

4) Representation: Sometimes “a picture is worth a thousand words” in mathematics too. Representation is about capturing a mathematical concept. Besides pictures, representations can include graphs, equations, charts, physical objects, and even numbers themselves. Finding a good representation is often a key to problem solving (for example, think about how much easier it is to multiply 24×19 than it is to multiply XXIII and XIX), and using several different representations for the same concept or problem can enhance understanding.

5) Mathematical Connections: Mathematics makes much more sense and is much more interesting when you can see the connections between different topics – both within mathematics and between math and other subjects. When you understand the relationships between different concepts, you don't need to memorize.

Math Leaders / Study Groups: We are fortunate to have students working as math leaders for the course. The math leaders will lead study groups for Math 140 and might be available for individual or group help outside of the study groups.

The study groups will provide an opportunity for you to discuss your homework with your ML and other students in the class and to get more individualized help with the material. Study groups are an important part of the course, and **attendance is mandatory**. Math 141 study groups don't have ML's, but they are still mandatory.

Expectations: You are expected to do the following:

1) Think. You are capable of thinking intelligently about mathematics (no matter what your previous experience has been). This class is not about memorization, and it is not about imitation.

2) Attend class, be on time, and participate. Attendance will be taken, and absences and lateness will negatively affect your grade. Class will start on time. If you are late (which you should not be), please enter the class in a quiet, non-disruptive way.

3) Work cooperatively with other students in class.

4) Take the initiative in getting help when you need it. Help can come from another student in the class, a math leader, a peer tutor, or the professor. If you would like a tutor, talk to your instructor or to the Office of Academic Assistance.

5) Seriously attempt all assigned homework, and turn in your assignments on time. If you miss class it is your responsibility to find out any announcements or assignments before the next class meeting. Homework must be handed in on time.

Homework:

Homework is critical for your success in this course. **You can expect an average of about eight hours per week of out of class work**, although this will vary from week to week and from student to student. You are strongly encouraged to work with other students when doing your homework, and your study group will provide a consistent opportunity for you to do so.

You are always encouraged and often expected to go beyond the homework assignment. Excellent teachers take initiative, they don't just do the minimum that they are told to do; if you haven't already begun this practice, this class is a great place to start.

Notebook: As part of the class, you will construct a notebook as a "record of practice." More detailed information will follow, but you should purchase a notebook for the next class. You will also need a folder or binder for handouts. You will find it helpful to have graph paper available, and you can do your homework on graph paper if you wish.

Baseline Proficiencies: To pass Math 141, you will need to pass several baseline proficiencies that address material that all future teachers should know. More details will be provided in the next few weeks.

Assessment/Evaluation: You will receive ample feedback about your progress in the course. In a few days, you will get a separate sheet explaining course policies.

Cheating: Cheating is, of course, unacceptable, and instructors will address it according to the Wheelock Policy on Academic Honesty, listed on pages 150-153 of the current course catalog. However, in a course like this, where students often work together, it can sometimes be a little confusing to figure out where to draw the line between cooperation and cheating. If you work with other students on a homework assignment, you should write up your final paper afterward when you are by yourself. You can (and are encouraged to) talk to other people in the class, and to the ML's, but you also need to make sure that you understand and can explain the group's results all by yourself.

Academic Support Services: The Office of Academic Advising and Assistance provides free support services for all Wheelock students. Peer tutors are available for most courses for students who want or need extra help with course content, and writing consultants are located in the Study Lounge (Library 205) to work with students on writing assignments (including writing for math classes) on a drop-in basis most afternoons and evenings until 10 p.m.

A new program of peer coaching in oral presentation will begin in November 2008, and before then coaching for oral presentations is available from faculty coaches.

For coaching in oral presentation contact Ellie Friedland at efriedland@wheelock.edu or ext. 2172.

While you should always speak with your instructor regarding any academic matters pertaining to specific courses, you are also encouraged to take advantage of academic support services.

Disability Services: It is the policy of Wheelock College to provide appropriate, reasonable accommodations to students who have documented learning, physical, cognitive, or psychiatric disabilities.

Students with disabilities are encouraged to meet with the course instructor. To receive appropriate accommodations students must contact the Director of Academic Assistance and Disability Services to register for services.

The Office of Academic Support and the Study Lounge are located on the 2nd floor of Library in Suite 205. For more information about these support options, contact either Paul Hastings (peer tutoring and disability services) at ext. 2304, phastings@wheelock.edu, or Jenne Powers (writing consultations) at ext. 2122, jpowers@wheelock.edu.

Tentative Outline of Topics:

First Semester, Math 140:

Topic I: Introduction to Problem Solving, Reasoning, and Communication,
(Chs 1 and 2.2)

Challenging new problems, introduces the important processes and the style of the course. Introduces algebraic thinking, which will be a theme throughout the course. Includes some geometry. (approx 5 weeks)

Topic II: Geometry (Ch 8-10)

Two and three dimensional geometry. Transformations
Introduction to Measurement. (approx 6 weeks).

Topic III: Data Analysis (Ch 6 and 7)

Using graphs, tables, and equations to make sense of real world data.
Surveys. Ways data can be misused. Probability, percents, proportions.
(Approximately 3 weeks)

First semester assignment: Reflective Letter, begin Portfolio.

Second Semester: Math 141

Topic IV: Number Systems (Ch 2.3)

Learning about different bases and deepening understanding of place value.
(approx 3 weeks.)

Topic V: Numbers and Operations (Ch 3 and 5)

Understanding addition, subtraction, multiplication, and division in multiple ways. Integers. Fractions and decimals: representations, ordering, mental math, operations (approx 8 weeks).

Topic VI: Number Theory (Ch 4)

Includes factors, multiples, prime and composite numbers, and divisibility rules. (Approximately 3 weeks)

Second Semester Assignment: Portfolio

******* Everything on this syllabus is subject to change *******