Math 130/131/132
Fall 2008

Concepts and Processes I, II, and III

Math 130
Section 1: M, W, F 8:30-9:45; Kate Hendrix CLR 002
Section 2: M, W, F 10:00-11:15; Chris Redford, ACW 205
Section 3: M, W, F 11:30-12:45; Yu Zhang, ACW 203
Section 4: M, T, R 4:00-5:15; Dorothy Gorenflo, ACW 205
Section 5: M, T, R 1:00-2:15; Dorothy Gorenflo,
CLR 002 – M; ACW 205 – T, R

Math 131:
Section 1: M, W, F 10:00 – 11:15; CLR 002; Maurice Page

Math 132
Section 1: M, W, F 8:30-9:45; ACW 205; Chris Redford
Section 2: M, W, F 11:30-12:45; CLR 002; Maurice Page

*****************************Contact Information for Instructors Deleted for Online Copy of Syllabus **

Course Description for Math 130/131/132: 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. Three-semester sequence, meets three periods per week, with an additional study group led by peer tutor. (First two semesters satisfy the Core Requirement in Mathematics).

Text/Materials: Bassarear, Tom, *Mathematics for Elementary School Teachers,* 4/e, Boston: Houghton Mifflin, 2008, 4th ed. The *Explorations Manual* is also required. The textbooks can be purchased at the new Wheelock online bookstore, http://wheelock.textbookx.com, at the Harvard Coop, or from other bookstores.

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.

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 the spreadsheet software 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 x 19 than it is to multiply XXIIII 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 many students working as math leaders for the course. The math leaders will lead study groups for Math 130 and Math 131, 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 132 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, an ML, 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. Your instructor will give you additional information about homework policies for your section.

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.

Baseline Proficiencies: To pass Math 131 and Math 132, 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. Your instructor will give you further details on how your work will be assessed and how your grade will be computed

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 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, we also encourage you 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:

Please Note: The schedule for Math 130-131 has changed from last year. The Math 131 class will follow the schedule given on last year's syllabus (topics are Whole Number Operations Part 2, Geometry, and Data Analysis). The schedule below is valid for Math 130 and Math 132 classes.

First Semester, Math 130:

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 7 weeks)

Topic II: Geometry (Ch 8-10)

Two and three dimensional geometry. Transformations Introduction to Measurement. (approx 7 weeks).

First semester assignment: Reflective Letter, begin Portfolio.

Second Semester: Math 131

Topic III: Number Systems (Ch 2.3)
Learning about different bases and deepening understanding of place value. (approx 4 weeks.)

Topic IV: Whole Number Operations (Ch 3)
Understanding addition, subtraction, multiplication, and division in multiple ways. We will explore this topic in great depth, both because it is central to the elementary curriculum and so that you experience exploring a topic in great depth. (approx 7 weeks).

Topic V: Data Analysis (Ch 7)
Using graphs, tables, and equations to make sense of real world data. Surveys. Ways data can be misused. (approx 3 weeks)

Second Semester Assignment: Portfolio submitted (final portfolio for students not continuing to Math 132)

Third Semester: Math 132 (note that you are strongly encouraged to complete Math 132, whether or not your program requires it).

Topic VI: Number Theory (Ch 4)
Includes factors, multiples, prime and composite numbers, and divisibility rules. (approx 4 weeks)

Topic VII: Extending the Number System (Ch 5)
Models, ordering, and operations with rational numbers. (approx 7 weeks)

Topic VIII: Measurement and Proportional Reasoning (Ch 6 and 10)
Continuation of both algebraic and geometric thinking, (approx 3 weeks)

Final assignment: Complete Math Portfolio.

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