MAT 117 Foundational Mathematics via Problem Solving I

Fall 2010 Section _____

Mondays & Wednesdays from _____

222 Carnegie

Instructor: _____

Office Location and Phone: _____

Email: _____

Office Hours: _____

Departmental Syllabus for

MAT 117 Foundational Mathematics via Problem Solving I

Course Supervisor: Dr. Joanna O. Masingila, 203 Carnegie, 315-443-1483, jomasing@syr.edu. Problems you cannot resolve with your instructor should be brought to the attention of the course supervisor.

Course Description: This course is one course in a two-course sequence. The course emphasizes learning through problem solving and uses the TI-73 (or TI-83/84 if student already has one) calculator as a learning tool. Topics include number concepts and relationships (including concepts of numeration, operations, number theory), probability, statistics and functions. The course is restricted to students in the Inclusive Elementary and Special Education program.

Textbooks:

(1) Masingila, J.O., Lester, F.K., & Raymond, A. M. (2006). *Mathematics for elementary teachers via problem solving: Student activity manual* (2nd ed). Bloomington, IN: Tichenor Publishing—must be purchased at the Syracuse University Bookstore. **[Note: Do not purchase used copies of this book.]**

(2) Masingila, J.O., Lester, F.K., & Raymond, A. M. (2006). *Mathematics for elementary teachers via problem solving: Student resource handbook* (2nd ed). Bloomington, IN: Tichenor Publishing—must be purchased at the Syracuse University Bookstore.

Required Supplementary Materials:

- 3-ring binder in which to keep daily HW, any class work not done in text, and all assignments (quizzes, papers, projects, tests)
- Folder with pockets in which to hand in HW to be graded
- TI-83+ or TI-84 graphics calculator—can be purchased at a variety of stores and the Syracuse University Bookstore

Course Philosophy: The emphasis in this course is on learning mathematical concepts through solving problems, and it is our conviction that problems are best solved in a cooperative learning situation. Hence, you will often work with two to four other students; an arrangement that we believe has the following advantages:

- Group problem solving is often broader, more creative, and more insightful than individual efforts.
- Interaction with others may stimulate additional problems, insights, and discoveries.
- Students can motivate one another to excel and to accept more challenging problems.
- Motivation to persevere with a problem may be increased.
- Socialization skills are developed and practiced.

- Students are exposed to a variety of thinking and problem-solving styles different from their own.
- Students learn to depend on themselves and each other (rather than on the instructor) for problem solutions.
- Conceptual understanding is deeper and longer lasting when ideas are shared and discussed.

Learning Outcome Goals:

- To help you develop an adult-level perspective and insight into the nature of foundational mathematics;
- To expose you to key, recurring themes, processes, and tactics in mathematics and help you make connections among mathematical ideas through these themes, processes, and tactics;
- To improve your ability to engage in mathematical thinking, reasoning, communication, and problem solving;
- To involve you in using technology as a tool to explore and learn mathematics;
- To encourage you to become reflective doers of mathematics;
- To learn mathematics through problem solving;
- To teach you in ways that fit the vision of the National Council of Teachers of Mathematics *Standards*; and
- To assess your learning in a variety of ways.

Class Attendance, Preparation, and Participation: In this class you will be learning mathematics by struggling with and solving problems. Attendance and participation in class is crucial, for active involvement is an integral part of this course. Preparation for each class is a must: look over previous work, attempt homework, bring required material, etc. Most class periods we will be using manipulatives and/or technological tools to explore mathematical concepts. Since much of the class is experiential, it would be impossible to derive the same benefits by merely examining someone's class notes or reading the textbook. Thus, you are EXPECTED TO ATTEND AND PARTICIPATE IN CLASS. If you miss three or more classes before the first exam, or between the first and second exam, you will be unable to participate in the part of the exam that is completed in a group.

Grading: Your final grade in this course will be based on class participation and your performance on quizzes, midterms, the final exam (which is cumulative), in- and out-of-class projects, and your classwork and homework (units). The relative weight assigned to each is designated below:

Midterm Exams (2)	30%
Final Exam	20%
Folders	20%
Projects	20%
Quizzes, Papers, Class Participation	10%

Midterm Exams and Final Exam: The two midterm exams will each have a group part and an individual part. The final will be cumulative and mandatory. If you must miss an exam, it is imperative that you call before the exam begins. Reasons for missing an exam must be documentable. Each case will be handled on an individual basis. **The final exam will be given on Wednesday, December 15, 2010 between 8:00 a.m. and 2:30 p.m. DO NOT MAKE PLANS TO LEAVE CAMPUS BEFORE 2:30 P.M. ON DECEMBER 15, 2010**. The specific time for MAT 117 will be announced during the semester.

Folders: Folders (comprised of in-class work and homework from specified chapters) will be graded on several occasions. You should hand in your classwork and the homework from the specified chapters in a folder as directed by your instructor. These will be graded for: completeness; accuracy of solutions; and quality of insight and reflection articulated in the writing responses. Always explain/show the thinking behind your answers and give examples to support your ideas.

Projects: You will be asked to do two group projects—a smaller one worth 5% of the final grade and a larger one worth 15%. Work on the projects will be mostly done out of class.

Binder: Your 3-ring binder is a very important part of the course. In general it will contain all homework and reflective writing responses plus all class work and assignments not done directly in the textbook. The material should be kept organized and work should be done neatly.

Quizzes: There may be quizzes that will test your understanding of basic concepts/skills associated with the current topic. There are no make-ups for missed quizzes.

Reflective Writing: One important way to learn mathematics is by verbalizing your ideas through oral and written means. Thus, reflective writing is an integral part of this course and of gaining an adult-level perspective on the mathematics in this course. Your instructor may assign additional writing assignments, beyond those listed in the syllabus.

Assessment and Grading: A variety of alternative assessment methods are used in this course because the course has a different goal than many mathematics courses you may have had before. The goal of this course is not to have you learn formulas or to teach you to work problems on tests that are similar to those previously encountered on homework, quizzes or class work. Rather, *the goal of this course is to have you develop good understanding of key mathematical ideas and to ensure that you can communicate these ideas clearly and efficiently to others*.

Students with Disabilities: If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), http://disabilityservices.syr.edu, located in Room 309 of 804 University Avenue, or call 315-443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

You are also welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations.

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see http://academicintegrity.syr.edu

MAT 117 - Fall 2010 - Course Schedule

The tentative course schedule is outlined below. You should come prepared for each day's in-class activities and attempt all **A** homework before the next class. You should try to complete the **B** homework within a week of it being assigned.

Key to abbreviations: SAM: Student Activity Manual (main textbook)
SRH: Student Resource Handbook
EMP: Exercises & More Problems (end of each chapter in SAM)

Date	***Class Activities***	***Homework***
Aug 30	Activities 1.1-1.2	A: Read syllabus, SAM pp. xv-xix & SRH pp. 19-26. Do Ch. 1 EMP #1-6, 30-32. B: Do Ch. 1 EMP #9, 11-12, 16, 18.
Sept 1	Activity 1.3	A: Do Ch. 1 EMP #39 and Activity 2.1. B: Do Activity 1.4, 1.7 and Ch. 1 EMP #21-23, 25-26, 42.
Sept 6	**No classes—Labor Day**	
Sept 8	Activities 2.2-2.3	A: Read SRH pp. 29-37. Do Activity 2.4 and Ch. 2 EMP #1, 3, 45. B: Do Ch. 2 EMP #4, 46, 48.
Sept 13	Activities 2.6-2.7	A: Do Activity 2.5 and Ch. 2 EMP #6, 11, 13, 49. B: Do Ch. 2 EMP #35, 39-40.
Sept 15	Activities 2.8-2.9	A: Do Ch. 2 EMP #7, 8, 20, 50. Read SRH pp. 47-48, 62-64.
Sept 20	Activity 2.10	A: Do Ch. 2 EMP #22, 38, 44, 47. ***Prepare/complete Ch. 1-2 material to be turned in on 9/27 for grading.***

Sept 22	Activity 3.1	A: Do Ch. 3 EMP #1, 6, 27, 30, 37-38. Read SRH pp. 44-46, 54-55, 59-61, 68-71.
Sept 27	Activities 3.2-3.3	A: Do Ch. 3 EMP #2-5, 7-10. Read SRH pp. 75-91.
Sept 29	Activities 3.4-3.5	A: Do Ch. 3 EMP #24-26, 28-29
Oct 4	Activities 3.6–3.9	A: Do Ch. 3 EMP #11-15, 17-23. B: Do Ch. 3 EMP #31-36. Read SRH pp. 92-94.
Oct 6	Activities 3.11-3.12	A: Do Ch. 3 EMP #39-45. ***Prepare/complete Ch. 3 material to be turned in on 10/13 for grading.***
Oct 11	TEST 1 (Group)	
Oct 13	TEST 1 (Individual)	
Oct 18	Activities 4.1–4.3	A: Complete Activity 4.2. Read SRH pp. 98-101. Do Ch. 4 EMP #2-6, 10, 39, 45, 61. B: Do Ch. 4 EMP #9, 11, 62, 79, 81.
Oct 20	Activity 4.4	A: Read SRH pp. 103-107. Do Ch. 4 EMP #7-8, 24-32.
Oct 25	Activities 4.5-4.6	A: Do Ch. 4 EMP #23, 82.
Oct 27	Activities 4.7-4.9	A: Read SRH pp. 108-112. Do Ch. 4 EMP #12, 14-16, 35, 63. B: Do Ch. 4 EMP #33, 36-38, 40-41, 56-57, 80.
Nov 1	Activities 4.10-4.11	A: Read SRH pp. 113-115. Do Activity 4.12 and Ch. 4 EMP #17-18, 65. B: Do Ch. 4 EMP #19, 48, 51, 66-68.
Nov 3	Activities 4.13-4.14	A: Do Ch. 4 EMP #69, 71. Read SRH 116-120. B: Do Activities 4.15-4.16 and Ch. 4 EMP #72, 74, 76. ***Prepare/complete Ch. 4 material to be turned in on 11/10 for grading.***
Nov 8	Activities 5.1-5.2	A: Read SRH pp. 140-145. Do EMPs for Activities 5.1-5.2.

Nov 10	Activities 5.3-5.4	A: Read SRH pp. 150-155. Do Activity 5.6 and EMPs for Activities 5.3-5.4. B: Do EMPs for Activity 5.6. ***Work on data analysis group project.***
Nov 15	Activity 5.7	A: Read SRH pp. 156-161. Do Activity 5.9 and EMPs for Activity 5.7. ***Data sets for data analysis group project must be approved.*** B: Do Activity 5.10 and EMPS for Activity 5.9 except for #1-2.
Nov 17	TEST 2 (Group)	
Nov 22	TEST 2 (Individual)	A: ***Written report for data analysis group project is due. Work on second group project.***
Nov 24	**No class—Thanksgiving Break**	
Nov 29	Activities 5.11-5.12	A: Read SRH pp. 123-127,137-139. Do EMPS for Activities 5.11 and 5.12. B: ***Prepare/complete Ch. 5 material to be turned in on 12/6 for grading.***
Dec 1	Activities 5.13-5.15	A: Do EMPS for Activity 5.14.
Dec 6	Project Presentations	A: Prepare for final exam.
Dec 8	Review for final exam	
Dec 15	FINAL EXAM	***Note: the exam will be given during a 2 hr period sometime between 8:00 a.m. - 2:30 p.m.***