**MATHEMATICS / MATHEMATICS EDUCATION 228**

**Spring 2011**

**Dr. Patricia Jaberg**

*Knowing mathematics means being able to use it in purposeful ways. To learn mathematics, students must be engaged in exploring, conjecturing, and thinking rather than only in rote learning of rules and procedures. Mathematics learning is not a spectator sport. When students construct personal knowledge derived from meaningful experiences, they are much more likely to retain and use what they have learned. This fact underlies the teachers’ new role in providing experiences that help students make sense of mathematics, to view and use it as a tool for reasoning and problem solving.*

*Curriculum and Evaluation Standards for School Mathematics: Executive Summary*,

National Council of Teachers of Mathematics, March 1989, page 5

**January 2011**

**MATHEMATICS / MATHEMATICS EDUCATION 228 – Spring 2011**

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**Course Description:**

**MATH 228. Fundamental Mathematical Concepts for Elementary Teachers.** 3 cr. Basic concepts and properties of set, number systems, and functions that apply to elementary school math. Prereq: MATH 100 or placement above MATH 100.

**M ED 228. Teaching Elementary School Mathematics.** 1cr. Principles, goals, methods and study of curricular content and assessment techniques; includes field experience.

**Course Goals:**

* The importance of problem solving in the elementary curriculum is clearly established by the emphasis given in the NCTM’s *Principles and Standards for School Mathematics* (2000).This course is designed to strengthen your own background in solving problems and in your ability to promote problem solving.
* The vision of mathematics as expressed by the National Council of Teachers of Mathematics on the cover page means thatmathematics educators are encouraging extensive changes in mathematics content and its teaching and learning. This course will be consistent with these changes.

**Course Learning Outcomes**

Preservice teachers (students) will be expected to develop and show competency in each learning outcome (the corresponding Wisconsin Teacher Standards are indicated)

**Preservice teachers will:**

1. **Develop mathematical understanding and problem solving ability** (WTS 1)

Demonstrate proficiency in mathematics content listed in the course description in relation to number and operations and algebra:

a. Foundational ideas related to operations of whole numbers and integers

1. Sets and set operations
2. Number theory
3. Sets of numbers including whole, rational and real numbers
4. Relations and functions

Demonstrate problem-solving abilities:

1. Using Polya’s problem solving framework to attack and solve problems
2. Learn about and use a variety of problem solving strategies

**2. Broaden their mathematical perspectives by exploring the connections that exist among mathematical topics and between mathematics and other content areas** (WTS 1 & 4) **and be familiar with the mathematics standards as presented in the National Council of Teachers of Mathematics (NCTM) *Principles and Standards for School Mathematics***

**3.**  **Understand how learning occurs in mathematics - how students construct knowledge and acquire skills, and know how to use instructional strategies that promote student learning for a wide range of students abilities** (WTS 1, 2, 4)**.**

**4. Learn about the content, methods, and materials (textbooks, resources, manipulatives, and technology) to assist them in planning meaningful activities for elementary students** (WTS 1 – 4, 7, 8 ).

**5. Be aware of current issues and topics of debate regarding mathematics education and develop the ability to create an instructional environment for mathematics that promotes problem solving with understanding for all** (WTS 2, 4, 7).

**6. Develop habits of reflective thought and examination of teaching practices** (WTS 9).

**Required Materials**

**Texts:** Billstein, Libeskind, & Lott. (2007). *A problem solving approach to mathematics for elementary*

*school teachers* (7th ed.). Boston: Addison Wesley Longman. (**TEXT RENTAL**)

Van de Walle, John A., Karp, Karen A., Bay-Williams, Jennifer M. (2010). *Elementary and Middle School Mathematics: Teaching Developmentally* (7th ed.). Boston, MA: Pearson. (**TEXT RENTAL**)

National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. (one copy provided to you for all mathematics education courses)

**Additional Readings:**

Ambrose, R. C. (2002). Are we Overemphasizing Manipulatives in the Primary Grades to the Detriment of Girls? *Teaching Children Mathematics, 9,* 16-21.

Hart, J. M. (1996). The Effect of Personalized Word Problems. *Teaching Children Mathematics, 2,* 504-505.

Labinowicz, E. (1987). The Interview Method. *Arithmetic Teacher*, 22-23.

Whitin, P. E. (2007), The Mathematics Survey: A Tool for Assessing Attitudes and Dispositions. *Teaching Children Mathematics, 8,* 426 – 432.

**Materials:** folders or binders to organize class handouts and assignments and a scientific calculator

**Optional materials:** colored pencils

**CLASS RESPONSIBILITIES**

**Participation and Preparation:** My teaching philosophy is learner focused. I attempt to design each class with you in mind. The assignments, tasks, and experiences are designed to promote your understanding. Your participation in class activities and discussion is not only important for your own learning, but also for the learning of others. You are expected to be a collaborative participant in the work of the class. It will be very important for you to exhibit good study habits by actively reading, preparing homework, participating in class tasks, writing reflections and synthesis papers, attacking the work with a positive attitude and being honest about your effort and preparation. Class time is to be solely devoted to the topics of the day, not for doing missing work or assignments from this or other courses. You will receive a participation/preparation grade; this will be based on your preparation of assignments for discussion and how you collaborate with group members and contribute to the large class discussion and other considerations.

***University guidelines suggest that students may need to spend 2-3 hours of preparation outside of class for every hour spent in class. MATH 228/ M ED 228 is essentially a four-credit class, so YOU should expect to spend 8-12 hours each week devoted to studying and preparing assignments for this class. If you experience difficulty in meeting or understanding course expectations, please come in during office hours, or make an appointment to discuss this with me immediately.***

**Conduct:** I will treat you as professionals and I expect the same in return.

**Attendance:** I expect you to arrive for class on time and be prepared to participate. Because much of the learning that will take place during class cannot be effectively transmitted through notes, you are expected to attend every class. If an occasion arises when you must be absent (illness, death in the family, etc.), you must notify me. To be granted an excused absence, you must contact me by phone or email to notify me of your absence. This should be done as soon as possible. If you do not contact me, you will be marked unexcused. More than four absences (excused or unexcused) will affect your final grade with a penalty of up to 5% reduction in your final grade (Note: Every three tardies count as one absence). You are responsible for all announcements and assignments made in your absence. See the paragraph below in relation to submission of work when are you are absent.

**ADDITIONAL NOTE on ATTENDANCE:** An absence on the day we have the 2-hour class is counted as two absences. Practicum experiences are required for this class. If you miss a practicum experience due to extenuating circumstances, you must make arrangements to make up a missed practicum on your own. Major emergencies will be handled on an individual basis.

**Submitting Work:** All assignments must be submitted at the beginning of the class period on or before the date indicated. **Late assignments will not be accepted for unexcused absences, nor can examinations or quizzes be made up for unexcused absences**. If you have an excused absence, assignments are to be turned in at the next class meeting. If a make-up quiz or exam is permitted, it must be done as soon as possible in consultation with the instructor.

**Academic Integrity: “**Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others’ academic endeavors. Students who violate these standards will be confronted and must accept the consequences of their actions.” A description of your rights and responsibilities as a member of the UW-SP community can be found at <http://www.uwsp.edu/admin/stuaffairs/rights/>

**Disposition/Attitude:** At the end of the semester you will be asked to self-assess your level of participation and preparation as well as disposition to learning exhibited during the course. The instructor will also assess participation and attitude. The assessment is based on general disposition indicators identified for preservice teachers. ***These disposition indicators help define the professional behaviors to be developed and exhibited by teacher candidates.***

**Disposition Indicators**

**Collaboration:** The ability to work together, especially in a joint intellectual effort.

**Honesty/Integrity**: The ability to demonstrate truthfulness to oneself and others; demonstrate moral excellence and trustworthiness

**Respect**: The ability to honor, value, and demonstrate consideration and regard for oneself and others

**Reverence for Learning:** Respect and seriousness of intent to acquire knowledge

**Emotional Maturity:** The ability to adjust one’s emotional state to a suitable level of intensity in order to remain engaged with one’s surroundings

**Reflection:** The ability to review, analyze, and evaluate the success of past decisions in an effort to make better decisions in the future

**Flexibility:** The willingness to accept and adapt to change

**Responsibility:** The ability to act independently, demonstrating accountability, reliability and sound judgment

**THEREFORE, IT IS YOUR RESPONSIBILITY TO:**

1. Be willing to explore, conjecture, and justify – participate as a mathematician
2. Complete reading and other assignments before coming to class
3. Reflect on previous material and assignments and take responsibility for your own learning
4. Be ready and willing to meaningfully participate in class activities and discussions
5. Maintain a positive and professional attitude and work ethic throughout the course
6. Believe you can learn the material and reflect on how it can be used in your future teaching career
7. Acknowledge that the instructor and others are concerned about your learning and are willing to assist you; therefore, seek out the instructor, peers, and those in academic support roles
8. Present assignments in a professional manner. Use pencil and eraser. Pens are not acceptable for mathematics. Word-process all other work (reflections, lesson plans, etc.).

**Other Important Concerns:**

**Disabilities:** If you have a disability, it is your responsibility to contact the Office of Disability Services during the first two weeks of classes and with the instructor to discuss accommodations.

**Religious Beliefs:** Students’ sincerely held religious beliefs will be reasonably accommodated with respect to all examinations and other academic requirements. According to UWS 22.03, you must notify the instructor within the first three weeks of classes about specific dates which require accommodation.

***If at any time you are unsure about what is expected of you, either in class or***

***in relation to assignments, please make an appointment to discuss this with me immediately.***

**ASSESSMENT INDICATORS (tentative):**

Exams 300 points

Graded homework, labs, synthesis paper 250 points

Lesson Plans\* 50 points

Assessment Analysis/Lesson Reflections\* 80 points

Self-assessment 15 points

Participation and Professionalism 50 points

Absences (beyond 4) and excessive tardiness – 5%

*\*One lesson plan and related /reflection is a required element of your SOE electronic teaching portfolio. Keep both a hard copy and electronic copy for your portfolio.*

Your grade, your points × 100 %, will be assigned based on the following scale:

total points

A: 94-100% A - : 90-93.9% B+: 87-89.9% B: 83-86.9% B-: 80-82.9 % C+: 77-79.9%

C: 73-76.9% C- : 70-72.9 % D+: 67-69.9% D: 60-66.9% F: 59.9 % or less

NOTE: **The same grade for both MATH 228 and MATH ED 228 will be assigned.**

**Points are posted in Desire2Learn after the completion of units and unit exam grades.**

**Check D2L through your “My Point” portal under Academics.**

**Besides office hours, there are many resources available to you!**

**MATH ROOM: Drop-in help and by appointment; A113 (Science); Free!**

**WRITING ASSISTANCE: Drop-in help and by appointment; TLC; Free!**

**INDIVIDUAL TUTORING: $8.50/session with 5 sessions minimum; TLC**

**STUDY GROUPS: Meet with your peers on a regular basis; Free!**

**FIFTH HOUR: Monday 4 – 5 p.m. Free!**

**Tentative Assignments and Schedule** are included on the next pages.

* ***Sections listed*** are from the Billstein, Libeskind & Lott text.
* ***Chapters listed*** are from the Van de Walle, Karp & Bay-Williams text.
* NCTM is the National Council of Teachers of Mathematics *Principles and Standards for School Mathematics* and a copy of the entire *Standards* will be distributed to you (and to be kept for Math Ed 338 and 345).

You are responsible for reading the assigned material and preparing exercises, problems and questions for discussion; you are responsible for presenting your work/solution during class time so sufficient work needs to be provided; if you do not understand concepts or problems, you are responsible for seeking assistance as we will not be able to go over every discussion problem/warm-up assigned.

* **All assignments handed in must be neatly presented** (Remove edges of spiral-bound paper). **You will be required to justify/explain your answers and show all work for complete credit.**
* **If you prepare discussion questions (math education) in writing in a timely manner, your preparation can be used on exams.**

**Exam Repair**

The purpose of this class is to enhance your mathematical understanding and your understanding of how children learn. To encourage you to increase your content knowledge, I will offer “exam repair.” For any mathematical content questions, you may earn back up to 75% of the points for those questions if you present sufficient evidence that you have relearned the material. These are the required elements:

1. Read the section material from the book and review class notes related to the question(s) you want to “repair.” Summarize the textbook explanation(s) and examples and/or class notes. Show the work for the examples provided. Write out additional notes from in-class examples.
2. Identify and do all exercises in the section related to the question(s) you want to “repair.” These need to be neatly done and labeled (section and page numbers). Sometimes you may have to locate some practice problems by using warm-ups or other class handouts. All work needs to be shown.
3. Now re-do the exam question(s). You need to have a total explanation of how you did the problem(s).
4. After all you have completed all the summaries, examples and “repairs,” write a paragraph explaining your method for relearning the material and what you now understand as a result of the repair process. Be very specific.
5. Make an appointment to see me.
6. Present all your materials and verbally explain how to do the problems.
7. Exam repair must be completed within two weeks of the return of the exam.

Contact me if you do not understand the procedure for “exam repair.” Exam Repair **does not include the math education questions.** For the math education questions, be sure you are spending time preparing and studying these questions prior to each exam. Although Exam Repair seems appealing, the best strategy is to learn the material as you go along. This is offered to encourage you to learn the material sufficiently to be able to teach the content “knowledgeably and confidently.”

**Tentative Assignments and Schedule**

This schedule is meant to provide general guidelines; announcements made in class may alter this schedule. Check weekly email messages for clarification of assignments.

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| --- | --- | --- | --- | --- | --- |
| **Date** | **Billstein Readings** | **Math Education Readings** | | **Class problems, questions for discussion** | **Assignments due** |
| **UNIT 1: Introduction to Problem Solving; Principles and Standards for School**  **Mathematics and Learning Mathematics with Understanding** | | | | | |
| Mon Jan. 24 |  |  |  | |  |
| Tues.  Jan. 25 |  | VdeW Chapter 1 (pp.1–10), *Teaching Mathematics in the Era of the NCTM Standards*  Whitin Article | VdeW p. 10, *Writing to Learn* # 2 – 5  Handout | |  |
| Thurs. Jan. 27 | pp. 1 – 18 *Mathematics and Problem Solving* | VdeW Chapter 2 (pp.13–29), *Exploring What It Means to Know and Do Mathematics* | VdeW p. 30, *Writing to Learn* #1, 3; *For Discussion and Exploration*, #1 | |  |
| Mon. Jan. 31 |  | NCTM Process Standards pp. 52 – 71, 116 – 141, 182 – 209 | Section 1.1, p. 19, #1a, 3, 4, 7, 12, 16, 22b  NCTM handout | | **Problem Set 1** [5] |
| Tues.  Feb. 1 |  |  |  | | **Tile Lab 1** |
| Thurs. Feb. 3 | pp. 22 – 35 *Explorations with Patterns* |  | p. 36–37, #2acef, 3acef, 7, 8, 15a, 17abc | | **Problem Set 2** [5] |
| Mon.  Feb. 7 | pp. 39 – 51  *Algebraic Thinking* |  | p. 51–52, #1, 2, 3, 14, 16; Review (p. 53) #20 – 22 | | **Problem Set 3** [10] |
| Tues.  Feb. 8 |  |  |  | | **Problem Set 4:** [10]  **Tile Lab 2** |
| Thurs. Feb. 10 |  |  | Ch. 1 Review (pp. 65–66 ), #1– 6, 18, 20 | | **Synthesis/Analy-sis paper** |
| Mon.  Feb. 14 |  |  |  | | **Chapter 1 Test** |
| Tues.  Feb. 15 |  | VdeW Chapter 8, (pp.125–142), *Developing Early Number Concepts and Number Sense* | VdeW p. 143, *Writing to Learn #1, 3, 4, 8* | | **Tile Lab 3** |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Class problems, questions for discussion** | | **Assignments due** |
| **UNIT 2: Sets, Whole Numbers, and Functions**  **Cognitively Guided Instruction and the Interview Method** | | | | | |
| Thurs.  Feb. 17 | pp. 69 – 82 *Describing Sets* |  | p. 83, #1ac, 2ace, 4a, 5a, 6, 7ace, 9 | |  |
| Mon.  Feb. 21 | pp. 84 – 91 *Other Set Operations and Their Properties* | VdeW Chapter 9, (pp.145–164) *Developing Meaning for the Operations* | Section 2.1, p. 92, #3ace, 6aceg, 10ace  VdeW p. 164, *Writing to Learn #3, 5, 6* | | **Problem Set 5** [5] |
| Tues.  Feb. 22 |  |  | p. 92–93 , #4aceg, 13ac, 15a, 16, 21, 26 | | **Lab 4** |
| Thurs.  Feb. 24 | pp. 96 – 108 *Addition and Subtraction of Whole Numbers* |  | pp. 108–109, #3, 5bd, 22  Review, p. 110, #36, 38 | | **Problem Set 6** [10] |
| Mon.  Feb. 28 |  |  |  | | **Problem Set 7** [5] |
| Tues.  Mar. 1 | pp. 111 – 124 *Multiplication and Division of Whole Numbers* |  | pp. 124–127, #3ace, 6, 8ac, 11ace, 13, TIMSS items | | **Lab 5**  **Writing Problems for Assessment** |
| Thurs.  Mar. 3 | pp. 125 – 139 *Functions* |  | pp. 139 – 143, #1ac, 2ac, 8, 9, 23, 24ac; p. 145 TIMSS items | |  |
| Mon.  Mar. 7 |  | NCTM *Numbers and Operations* Standard, pp. 32 – 36, 78 – 88  Labinowicz article | Ch. 2 Review pp. 148–150, #1–7, 11, 14, 31 | | **Problem Set 8** [10] |
| Tues.  Mar. 8 |  | **Practicum** |  | | **Conduct Assessment Lesson** |
| Thurs.  Mar. 10 |  |  |  | | **Analysis and Reflection of Practicum 1** |
| Mon.  Mar. 14 |  |  |  | | **Chapter 2 Test** |
| Tues.  Mar. 15 | pp. 152 – 166  *Numeration Systems* | Hart article  VdeW Chapter 12, (pp.213–237) *Developing Strategies for Whole Number Computation* | pp. 166–167, #1, 7ac, 15ace, 24ac, 26ace  VdeW p. 237 – 238, *Writing to Learn*  *#1, 2 ,4, 7* | |  |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Class problems, questions for discussion** | | **Assignments due** |
| **UNIT 3: Numeration Systems and Whole Number Computation** | | | | | |
| Thurs.  Mar. 17 |  | VdeW Chapter 3 (pp.32–47), *Teaching Through Problem Solving* | VdeW p. 56,  *Writing to Learn*  #1, 2, 4, 5 | | Lesson Plan 1 Draft |
| **Spring Break March 21-25 No Classes** | | | | |  |
| Mon.  Mar. 28 | pp. 169 – 178  *Algorithms for Whole-Number Addition and Subtraction* | Ambrose article | pp. 178–179, #8a, 13b, 14a, 17ace | | **Reflection** - Ambrose  **Problem Set 9** [5] |
| Tues.  Mar. 29 |  | **Practicum** |  | | **Facilitate Lesson Plan 1** |
| Thurs.  Mar. 31 | pp. 182 – 194  *Algorithms for Whole-Number Multiplication and Division* |  | pp. 194–195, #2a, 5ac, 6a, 7ac | | **Final Lesson Plan 1 and Reflection on Practicum 2** due |
| Mon.  Apr. 4 | pp. 199 – 206  *Mental Mathematics and Estimation for Whole Number Operations* |  | pp. 206 – 208, #2c, 8acd, 18a, 22cd, 34a | | **Problem Set 10** [10] |
| Tues.  Apr. 5 |  | VdeW Chapter 11, (pp.187–210) *Whole Number Place-Value Development* | VdeW p. 210, *Writing to Learn*  *#1, 2 ,4, 7* | | Draft of lesson 2 |
| Thurs.  Apr. 7 |  |  |  | | **Problem Set 11**  [10] |
| **UNIT 4 : Integers and Number Theory; Teaching Through Problem Solving** | | | | | |
| Mon.  Apr. 11 | pp. 215 – 227  *Integers and Operations of Addition and Subtraction* |  | pp. 228–229, #4ac, 11a, 18acegi, 29c, 30ac | |  |
| Tues.  Apr. 12 |  | **Practicum** |  | | **Facilitate Lesson Plan 2** |
| Thurs.  Apr. 14 | pp. 232 – 242  *Multiplication and Division of Integers* |  | pp. 242–245, #1, 6ac, 14a, 16d, 29ac, TIMSS items  Ch. 3 Review (pp. 210–211) #2ace, 3ace, 4ac, 5, 10, 26, 29, 32, 37 | | **Lesson Plan and Reflection** (on Practicum 3)  **Problem Set 12** [10] |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Class problems, questions for discussion** | | **Assignments due** |
| Mon.  Apr. 18 |  |  |  | | **Chapter 3 Test** |
| Tues.  Apr. 19 | pp. 246 – 255  *Divisibility* |  | pp. 255–257, # 3a, 4ac, 7ac, 8be | | **Sieve of Erastothenes Lab** |
| Thurs.  Apr. 21 |  |  |  | |  |
| Mon.  Apr. 25 |  |  |  | | **Problem Set 13** [15] |
| Tues.  Apr. 26 | pp. 259 – 269  *Prime and Composite Numbers* |  | pp. 269–270, # 2e, 3b, 6cd, 29a | |  |
| Thurs.  Apr. 28 |  |  |  | | **Problem Set 14** [10] |
| Mon. May 2 | pp. 273 – 282  *Least Common Divisor and Least Common Multiple* |  | pp. 282–284, # 3ac, 4c, 16aceg, 52, NAEP | | **Problem Set 15** [5] |
| Tues.  May 3 |  |  |  | | **Problem Set 16** [10] |
| Thurs.  May 5 | pp. 346 – 354  *Proportional Reasoning*  pp. 297 – 310  *The Set of Rational Numbers* |  | pp. 310 – 313, #5, 6, 32c, TIMSS  p. 355, #4, 10 | |  |
| Mon.  May 9 | pp. 314 – 325  *Addition and Subtraction of Rational Numbers* |  | pp. 325 – 326, #1, 7–10 | | **Chapter 4 Lab** |
| Tues.  May 10 | pp. 329 – 342  *Multiplication and Division of Rational Numbers* |  | p. 342, #2b, 9–12 | | **Problem Set 17** [10] |
| Thurs.  May 12 |  |  | Review  Ch. 4 Review: pp. 294–295, # 1e, 4, 5, 6a, 12ad, 14, 15, 17, 19, 20, 24, 25 | |  |
| Tues  May 17 | **12:30 – 2:30 p.m. FINAL EXAM (focus on Chapters 4 & 5)** | | | | |

**Tentative Assignments and Schedule (option 2)**

This schedule is meant to provide general guidelines; announcements made in class may alter this schedule. Check weekly email messages for clarification of assignments.

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| **Date** | **Billstein Readings** | **Math Education Readings** | | **Assignments due** | | **Class problems, questions for discussion** |
| **UNIT 1: Introduction to Problem Solving; Principles and Standards for School**  **Mathematics and Learning Mathematics with Understanding** | | | | | | |
| Thurs. Sept. 2 |  |  |  | | |  |
| Tues.  Sept. 7 |  | VdeW Chapter 1 (pp.1–10), *Teaching Mathematics in the Era of the NCTM Standards*  Whitin Article |  | | | VdeW p. 10, *Writing to Learn* # 2 – 5  Handout |
| Thurs. Sept. 9 | pp. 1 – 18 *Mathematics and Problem Solving* | VdeW Chapter 2 (pp.13–29), *Exploring What It Means to Know and Do Mathematics* |  | | | Section 1.1, p. 19, #3, 4, 7  VdeW p. 30, *Writing to Learn* #1, 3; *For Discussion and Exploration*, #1 |
| Mon. Sept. 13 |  | NCTM Process Standards pp. 52 – 71, 116 – 141, 182 – 209 | **1.1A Problem Set**: [5] (p.19) #1b, 2; Show all work | | | Section 1.1, p. 19, #1a ,12, 16, 22b  NCTM handout |
| Tues.  Sept. 14 |  |  | Tile Lab 1 | | |  |
| Thurs. Sept. 16 | pp. 22 – 35 *Explorations with Patterns* |  | **1.1B Problem Set:** [5] (p.19-20) #18, 22a; Show all work | | | p. 36–37, #2acef, 3acef, 7, 8, 15a, 17abc |
| Mon.  Sept. 20 | pp. 39 – 51  *Algebraic Thinking* |  | **1.2 Problem Set:** [10] (p.36–37) #2bd & 3bd (list next 3 terms, justify type), 9, 15bc, 17d (briefly justify all) | | | p. 51–52, #1, 2, 3, 14, 16; Review (p. 53) #20 – 22 |
| Tues.  Sept. 21 |  |  | Tile Lab 2  **1.3 Problem Set:** [10] p.37, #21; p. 52, 7, 13; p. 66, #13 | | |  |
| Thurs. Sept. 23 |  |  | Synthesis/Analysis paper | | | Ch. 1 Review (pp. 65–66 ), #1– 6, 18, 20 |
| Mon.  Sept. 27 |  |  | **Chapter 1 Test** | | |  |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Assignments due** | | | **Class problems, questions for discussion** |
| **UNIT 2: Numeration Systems and Whole Number Computations (Chapter 3)**  **Cognitively Guided Instruction and the Interview Method (handouts)** | | | | | | |
| Tues.  Sept. 28 |  | VdeW Chapter 8, (pp.125–142), *Developing Early Number Concepts and Number Sense* | Tile Lab 3 | | | VdeW p. 143, *Writing to Learn #1, 3, 4, 8* |
| Thurs.  Sept. 30 | pp. 152 – 166  *Numeration Systems* |  |  | | | pp. 166–167, #1, 7ac, 15ace, 24ac, 26ace |
| Mon.  Oct. 4 | pp. 169 – 178  *Algorithms for Whole-Number Addition and Subtraction* | VdeW Chapter 9, (pp.145–164) *Developing Meaning for the Operations* | **3.1 Problem Set:** [5] (p. 166–167), #15bdf, 24bd, 26bdf | | | pp. 178–179, #8a, 13b, 14a, 17ace VdeW p. 164, *Writing to Learn #3, 5, 6* |
| Tues.  Oct. 5 |  |  | Lab 4 | | |  |
| Thurs.  Oct. 7 | pp. 182 – 194  *Algorithms for Whole-Number Multiplication and Division* |  |  | | | pp. 194–195, #2a, 5ac, 6a, 7ac |
| Mon.  Oct. 11 | pp. 199 – 206  *Mental Mathematics and Estimation for Whole Number Operations* |  | **3.2–3.3 Problem Set:** [10] (p. 178–180), #8b, 31, 32 (#31 &32 – be sure to analyze the student work and con-sider a developmental approach); (p. 194–196), #2b, 3, 5bd, 6b, 7b (label dimen-sions and indicate partial products), 38d (do not convert to base ten) | | | pp. 206 – 208, #2c, 8acd, 18a, 22cd, 34a |
| Tues.  Oct. 12 |  | VdeW Chapter 12, (pp.213–237) *Developing Strategies for Whole Number Computation* Hart article | Lab  **Writing Problems for Assessment** | | | VdeW p. 237 – 238, *Writing to Learn #1, 2 ,4, 7* |
| Thurs.  Oct. 14 | pp. 69 – 82 *Describing Sets* |  | **3.4 Problem Set:** [10] (p. 206–207), #1b, 2b, 5bd, 7b (“counting on to”), 14, 18bc, 22ab, 27 (also use V de W); (p. 209), #8 | | | p. 83, #1ac, 2ace, 4a, 5a, 6, 7ace, 9 |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Assignments due** | | | **Class problems, questions for discussion** |
| **UNIT 3: Sets, Whole Numbers, and Functions (Chapter 2)** | | | | | | |
| Mon.  Oct. 18 | pp. 84 – 91 *Other Set Operations and Their Properties* | NCTM *Numbers and Operations* Standard, pp. 32 – 36, 78 – 88  Labinowicz article |  | | | p. 92, #3ace, 6aceg, 10ace |
| Tues.  Oct. 19 |  | **Practicum** | **Conduct Assessment Lesson** | | |  |
| Thurs.  Oct. 21 |  |  | **Analysis and Reflection of Practicum 1** | | | Ch. 3 Review (pp. 210–211) #2ace, 3ace, 4ac, 5, 10, 26, 29, 32, 37 |
| Mon.  Oct. 25 |  |  | **Chapter 3 Test** | | |  |
| Tues.  Oct. 26 |  |  | Lesson Plan 1 Draft  **2.1 Problem Set**: [5] (p. 83), #1d (use the listing method), 2bd, 4b, 5b, 7bdf | | | p. 92–93 , #4aceg, 13ac, 15a, 16, 21, 26 |
| Thurs.  Oct. 28 |  | VdeW Chapter 3 (pp.32–47), *Teaching Through Problem Solving* | **2.2 Problem Set**: [10] (p. 92), #4bdf, 6bdfh, 13bd, 15b, 22 | | | V de W, p. 56 *Writing to Learn* #1, 2, 4, 5 |
| Mon.  Nov. 1 | pp. 96 – 108 *Addition and Subtraction of Whole Numbers* | Ambrose article | Ambrose **Reflection** | | | pp. 108–109, #3, 5bd, 22  Review, p. 110, #36, 38 |
| Tues.  Nov. 2 | **Practicum** |  | **Facilitate Lesson Plan 1** | | |  |
| Thurs.  Nov. 4 | pp. 111 – 124 *Multiplication and Division of Whole Numbers* |  | **Final Lesson Plan 1 and Reflection on Practicum 2** due | | | pp. 124–127, #3ace, 6, 8ac, 11ace, 13, TIMSS items |
| Mon.  Nov. 8 |  | VdeW Chapter 11, (pp.187–210) *Whole Number Place-Value Development* | Draft of lesson 2 | | | VdeW p. 210, *Writing to Learn*  *#1, 2 ,4, 7* |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Assignments due** | | | **Class problems, questions for discussion** |
| Tues.  Nov. 9 | pp. 125 – 139 *Functions* |  | **2.3 Problem Set**: [5] (p. 108), #4, 6bdf; (p.110) 41, 42 | | | pp. 139 – 143, #1ac, 2ac, 8, 9, 23, 24ac; p. 145 TIMSS items |
| Thurs.  Nov. 11 |  |  | **2.4– 2.5 Problem Set:** [10] (p. 124–125), #3bdf, 8bde, 11bdf  (p. 139–143) #1bd, 4, 5bd, 24bd | | | Ch. 2 Review pp. 148–150, #1–7, 11, 14, 31 |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Assignments due** | | | **Class problems, questions for discussion** |
| **UNIT 4 : Integers and Number Theory; Teaching Through Problem Solving** | | | | | | |
| Mon.  Nov. 15 |  |  | **Chapter 2 Test** | | |  |
| Tues.  Nov. 16 | **Practicum** |  | **Facilitate Lesson 2** | | |  |
| Thurs.  Nov. 18 | pp. 215 – 227  *Integers and Operations of Addition and Subtraction* |  | **4.1 Problem Set**: [10] (p. 228–229), #4bd, 11b, 12bdf, 16bd, 18bdfh, 22bdf, 30b | | | pp. 228–229, #4ac, 11a, 18acegi, 29c, 30ac |
| Mon.  Nov. 22 | pp. 232 – 242  *Multiplication and Division of Integers* |  | **Lesson Plan and Reflection** (on Practicum 3) | | | pp. 242–245, #1, 6ac, 14a, 16d, 29ac, TIMSS items |
| Tues.  Nov. 23 | pp. 246 – 255  *Divisibility* |  | **Sieve of Erastothenes** | | | pp. 255–257, # 3a, 4ac, 7ac, 8be |
| Thurs.  Nov. 25 | Thanksgiving – No Class | | | | | |
| Mon.  Nov. 29 |  |  | **4.2 Problem Set**: [15] (p. 242–244), #2, 6bdf, 7bdfh, 14b, 15bdfhjlnp, 16be, 19c, 22fghjln, 29bd, 30b (#29e EC); | |  | |
| Tues.  Nov. 30 | pp. 259 – 269  *Prime and Composite Numbers* |  |  | | pp. 269–270, # 2e, 3b, 6cd, 29a | |
| Thurs.  Dec. 2 |  |  | **4.3 Problem Set**: [10] (p. 255–256), #2bd, 3b, 4ae, 6ace, 9bdf, 13b, 15bc | |  | |
| **Date** | **Billstein Readings** | **Math Ed. Readings** | **Assignments due** | | **Class problems, questions for discussion** | |
| Mon. Dec. 6 | pp. 273 – 282  *Least Common Divisor and Least Common Multiple* |  | **4.4 Problem Set**: [5] (p. 269–270), #1, 2b, 3c, 5, 6ab, 29b | | pp. 282–284, # 3ac, 4c, 16aceg, 52, NAEP | |
| Tues.  Dec. 7 |  |  | **4.5 Problem Set**: [10] (p. 282–283), #2bd, 3b, 4b, 5b, 10, 12, 24, 33, 35 (EC: # 51) | |  | |
| Thurs.  Dec. 9 | pp. 346 – 354  *Proportional Reasoning*  pp. 297 – 310  *The Set of Rational Numbers* |  |  | | pp. 310 – 313, #5, 6, 32c, TIMSS  p. 355, #4, 10 | |
| Mon.  Dec. 13 | pp. 314 – 325  *Addition and Subtraction of Rational Numbers* |  | **Chapter 4 Lab** | | pp. 325 – 326, #1, 7–10 | |
| Tues.  Dec. 14 | pp. 329 – 342  *Multiplication and Division of Rational Numbers* |  | **Chapter 5 Problem Set**: [10] (p. 313), #42ab, 43; (p.327), #21 & 22abcd, 33; (p. 344), #36, 39b | | p. 342, #2b, 9–12 | |
| Thurs.  Dec. 16 |  |  |  | | Review  Ch. 4 Review: pp. 294–295, # 1e, 4, 5, 6a, 12ad, 14, 15, 17, 19, 20, 24, 25 | |
| Mon  Dec. 20 | **12:30 – 2:30 p.m. FINAL EXAM** | | | | | |