

MATH 310: Elementary Mathematics II - Dr. Miller - Course Info SUMMARY - Spring 2018

This 2-page summary was handed out in class, but you are responsible for reading the FULL SYLLABUS which begins on p.3.

Meeting Time/Place: TR 2:00-3:15 or 3:30-4:45, VSC 203

Course Description/Content: (The Department-approved Student Outcomes are on the back.)

- SRU Catalog: Finishes exploring the development of the number system by looking at the rational and real numbers and then looks at measurement, statistics, and probability.
- This course often requires explanations and is very VERBALLY oriented.

Prerequisite: Passing grade in MATH 210 Follow-Up: You may need a C in this course. Ask your advisor.

Texts: *A Problem Solving Approach to Mathematics ...* by Billstein, et al. (TWELFTH edition, white cover)

Contact and Office Hours: Email: lyn.miller@sru.edu - Phone: 724-738-2878 - Office: Room VSC 200B

- My web page is granite.sru.edu/~lmiller . (No “www.” and no D2L except for exam grades)
- Assignments, other information will be posted regularly on the sub-page for our course (not D2L).
- Drop-in Office Hours: MWF 9:30-10:30, MW 3-4:30. I’m also available by appointment.
- In person or email, **SEEK HELP EARLY AND OFTEN!**

Classroom environment: I write on the board, speak, and use printed worksheets to teach; take careful notes!

- I CANNOT ALLOW FOOD/DRINKS in the classroom due to SRU-documented disability.
- See me if this restriction conflicts with your own documented accommodations.
- Don’t distract yourself with cell phone use or off-topic chatter during class.

Grading: $A = 90 - 100\%$; $B = 80 - 89\%$; $C = 70 - 79\%$; $D = 60 - 69\%$; $F = 0 - 59\%$.

- Course total = 500 points: Quiz-HW Score = 50 pts, Exams 1-3 = 100 pts each, Final = 150 pts
- I don’t give attendance or “effort” points nor extra credit opportunities.
- Students with SRU-documented test or HW accommodations should notify me during the first week of class.

Homework/Quizzes: Worth 50 points total: 5 points each, best 10 out of 12-15 are kept at end of course

- Daily reading and assignments are posted on my WEB PAGE (not on D2L).
- In-class quizzes or HW collection will occur nearly every week, announced in advance.
- Write legibly and leave plenty of room for me to comment. I often ask for explanations.
- **Make-ups - NONE**, nor any late. Keeping your best TEN scores allows for travel, illness, etc.
- This is like earning “personal days” at work; everybody is allowed to miss, but choose wisely.
- Turning in HW early or via email when you’ll be absent is usually approved, but ask first.
- You may collaborate on HW (but NOT quizzes): **do not COPY** from others, the web, books, etc.
- Inappropriate collaboration may result in a score of 0 for all involved, regardless of intent.
- Solutions (sometimes partial) will typically be posted outside my office door.
- To honor copyright and other laws, do NOT share solutions on social media or web sites.

Mid-Term Exams: Worth 100 each for Exam #1, #2, #3, no collaboration

- Topics List will be provided in advance. Study thoroughly, based on that List.
- I seldom ask for answers alone, but often ask for work or explanation also to earn full credit.
- Explanations/work are graded on correct MATH knowledge, notation, reasoning, etc., not “effort.”
- Make-up approval requires prior notification, and documentation. **The Final is your make-up.**
- Mid-term exam dates: February 23 \pm 2 class days, March 30 \pm 2 class days, April 26 for sure
- Calculators are permitted on exams, but NOT cell phones, and NOT with text-based memory.
- Calculator covers, water, IDs, etc., and other items cannot be on your table or in view during exams.

Final Exam: cumulative, worth 150 points total, no collaboration

- You MUST take the Final at the scheduled time for YOUR section of the course.
- Dates: Thursday, May 10, 10:30-12:30 (2:00 class) or Tuesday, May 8, 1:00-3:00 (3:30 class).

- Students with SRU-documented disabilities must submit exam paperwork one week in advance.

Attendance: A sign-in sheet circulates daily, but attendance does NOT count toward your grade.

- If you are absent, YOU must make arrangements to catch up for the next class.
- Get contact info for a classmate; if you're absent, get their notes. (I teach from a basic outline, not notes.)
- Assignments and announcements are available via my web page granite.sru.edu/~lmiller.

Student Outcomes - Math 310: Elementary Mathematics II
(SRU Department of Mathematics - Fall 2011 PDF version)

- 1. Students will demonstrate an understanding of and ability to work with the rational numbers. This includes the following topics**
 - (a) Definition of the rational numbers using equivalence classes of integers
 - (b) Definition of the operations for the rational numbers using equivalence classes
 - (c) Properties of these operations (closure, commutative, associative, identities, inverses, distributive)
 - (d) Ordering of the rational numbers
 - (e) Rational numbers as fractions
 - (f) Algorithms for the rational numbers as fractions
 - (g) Rational numbers as decimals
 - (h) Algorithms for the rational numbers as decimals
 - (i) Percent
 - (j) Ratio and proportion
- 2. Students will demonstrate an understanding of and ability to work with the real numbers. This includes the following topics**
 - (a) Rational numbers vs. irrational numbers
- 3. Students will demonstrate an understanding of and ability to work with statistics. This includes the following topics**
 - (a) Organizing and picturing data, including circle graphs and frequency distributions
 - (b) Measure of central tendency and spread; box-and whisker plots
 - (c) Abuses of statistics
- 4. Students will demonstrate an understanding of and ability to work with probability. This includes the following topics**
 - (a) Experimental probability: computation and simulation
 - (b) Theoretical probability: sample spaces, events, computation
 - (c) Methods of counting
 - (d) Permutations and combinations in probability
 - (e) Conditional probability
 - (f) Odds and expected value
- 5. Students will demonstrate an understanding of and ability to work with measurement. This includes the following topics**
 - (a) Measurement with nonstandard and standard units
 - (b) Length and area
 - (c) Pythagorean Theorem
 - (d) Surface area
 - (e) Volume

Important University-wide policy statement on sexual violence, required on all course syllabi:

“Slippery Rock University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University’s Title IX Coordinator. The only exceptions to the faculty member’s reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: <http://www.sru.edu/offices/diversity-and-equal-opportunity/sexual-misconduct-and-victim-resources>.
”

The full, more detailed SYLLABUS is posted online. YOU ARE RESPONSIBLE for reading it in its entirety.

(Its first 2 pages form a vital contract that affects EVERY CLASS DAY, so they are attached here. Fair warning!)

- **What This Course Is About, Why You Need It, and How It's Taught**

Content: MATH 210-310 develop what's called mathematical content knowledge – concepts and techniques – dealing with number systems taught in Grades K-6. It's not a methods course (i.e., “how to teach”); it's deep study of the actual K-6 math knowledge.

Rationale: You need deep understanding of that knowledge if you will be certified to teach children in **any** subject or **any** grade level in that range because the most effective teachers have a broad view of what's going on in their students' education overall, including what happens in other classes or in earlier or later grade levels. This is why SRU requires you to take courses in many different areas that your students will learn, even though you yourself might not teach those subjects.

Pedagogy: We use a problem-solving approach that requires critical and flexible thinking, so prepare to work hard. The room is designed for collaborative learning, which occurs for part of most class days. I call on individuals or collaborative groups often to share ideas. Despite the course title, don't expect to learn at just a child's level: we dig much more deeply into the content so **you** will have the thorough, connected understanding you'll need to help children put math into perspective, to identify sources of confusion, and to adapt ideas to help struggling students.

Often in the course I'll ask you to explain things. “EXPLAIN” always means “USE WORDS.” More about my expectations for explanations can be found in the section on Criteria.

Recent research shows two things that may surprise you:

1) Students who take notes by hand learn and retain information better than those who try to type on a laptop. (There's even some exploration of whether organizing notes entirely for yourself versus filling in notes on prepared slides or handouts makes a difference in learning!) I use the board a LOT to model how to organize your thoughts as you learn, but don't fall into the trap of thinking that only things I've written should be things you write. As I speak, or as your classmates speak, try to listen for the key idea or question, what are the highlights, what are the potential errors, and jot those things down in your notes too. This also gives you a chance to practice skills that will be very handy during parent-teacher conferences, when you have to listen to and converse with parents, while also trying to keep a useful record of what was discussed.

2) Cell phone use during class - even by strong students - has a negative effect on their learning and performance. For that reason, I am (re-)instituting a penalty policy like some used to deter technology distractions in middle and high school students. Specifically, your cell **PHONE MUST BE OUT-OF-SIGHT** for the entire class period, whether we are doing lecture, group-work, quiz, etc. If I see it out, or see you glancing furtively toward a phone you tried to sneak onto your lap, side pocket, under your bookbag, etc., you'll get a 2-point deduction on your next Quiz/HW score. Bottom line: phone use in class is proven bad for learning and you're future teachers, so model good learning habits starting now.

- **What the Class Environment Is Like:**

Physical Environment: We meet TR 2:00-3:15 or TR 3:30-4:45 in Room VSC 203. Along with using collaborative learning, I write on the side board and use the front

projector screen. Seat yourselves so everyone at the table can see and hear well.

Cognitive Environment: You're future teachers, so respect the process of learning: don't use cell phones (deduction!) or other technology during class, and don't distract your classmates with off-topic conversation. Begin now to think about classroom behavior as the teacher you will soon be; your days in the role of student are ending. I encourage collaboration in and out of class, but collaborating isn't the same as copying (cheating) from a partner nor even having an entire group agree on a common response. You should always arrange your own work in your own way and give explanations in your own words, for when you don't, you set yourself up to do poorly in settings where you are expected to work alone, like on exams or in your own classroom.

Health Environment: **I CANNOT PERMIT FOOD OR DRINKS** in our classroom due to serious respiratory issues. Plain water is allowed. See me immediately if this ADA accommodation conflicts with your own documented needs, so that we can craft appropriate adjustments. As teachers, you will be involved in implementing accommodations (sometimes called "504 Plans") for children with disabilities in your own classrooms; federal law protects the rights of the disabled, including those with health disabilities. Start now to become more aware of such situations.

- **How You Can Contact Me Or Get Extra Help:**

Getting Help From Me: I am always willing and happy to work with students who need extra help. Make a good-faith effort to organize your thoughts before seeing me, however. Students who come asking for help or extra practice on a specific problem or topic that they've already looked over benefit much more than students who've not tried to study for days and simply say, "I'm lost; can you teach me everything again?"

Office Hours and Contact Info: My drop-in office hours for Spring 2018 are MWF 9:30-10:30 and MW 3-4:30; occasional health issues and other conflicts may require rescheduling, which I'll announce in advance when possible. We can also make an appointment to meet at a mutually convenient time. My email is lyn.miller@sru.edu, office phone number is 724-738-2878, and office location is 200-B VSC inside the Mathematics Department office suite. Please do not bring food or beverages into my office; there is a kitchen area near my door where you can leave such items while we meet.

Other Sources of Help: The University offers two FREE tutoring services for lower-level math courses: the Tutoring Center run through the Dept. of Academic Services, and the Math Assistance Center (MAC) operated by the Math/Stats Department. The Tutoring Center can assign you an individual or small group tutor, but there are limits to how often you can meet with that person each week. MATH 210-310 tutors' schedules fill up very early in the semester, so if you wait, you may not get one, or it may be someone who hasn't had the course (not helpful). The MAC is a walk-in service held in our classroom VSC 203, Monday-Thursday nights 5-10pm. The tutors rotate but are math majors, and usually one has taken MATH 210-310, so ask when you arrive - you want to work with that person, not someone who's never seen our course. The MAC is walk-in, so you may have to work as part of a group or let the tutor trade off working with other students. However, there is no limit to how often you can come or how long you can stay at the MAC. Some students like to set up their own study groups with classmates and meet in or near the MAC to have extra help handy if it's needed. Remember, you are allowed and encouraged to study together for this course.

- **Background and Materials You Need for the Course:**

Pre-/Post-Requisites: The course prerequisite is a passing grade in MATH 210. Some certification areas also require you to earn a C in our course. Check with your advisor.

Texts: Our text is the white 12th edition of *A Problem Solving Approach to Mathematics* by Billstein. The Billstein text is used for MATH 210, 310 and 118; those of you who go on will not have to buy a new text in those courses. You need not bring the textbook to class, but you should bring all supplemental materials (notes, activities, HW) with you each day.

Online Tools: Online notices and extra materials are posted daily on my web page at granite.sru.edu/~lmiller (no “www.”) but NOT on D2L. D2L’s password-exclusive nature prevents others outside our course from viewing materials I’d like to share freely. I try to post your current course scores and grade on the D2L gradebook immediately after each exam (so 3 times per semester), but be aware that SRU considers D2L gradebooks unofficial.

In-Class Tools: You ARE permitted to use a calculator for most tasks in this course, but it can’t be your cell phone and on exams it can’t be a graphing calculator or one that has text-based memory. Calculator covers must be put away during exams. I will go around the room during each exam to approve calculators. If you bring an unacceptable calculator for an exam, you’ll have to do without (same if you forget). A cheap calculator is fine (some stores have them for just \$1-2); it only needs a square root key in addition to ordinary arithmetic; an exponent key is helpful but not necessary. We use some physical manipulatives in class, but they cannot leave the room; for homework I may instruct you in making your own substitutes or using online versions.

• How Your Grade Is Determined

Overall: Your grade for the course is based on frequent HW/quizzes (50 points total), three midterm exams (100 points each), and a final exam (150 points), for a semester total of 500 possible points. The letter grade designations are awarded by 10% increments:

$$A = 90 - 100\%; B = 80 - 89\%; C = 70 - 79\%; D = 60 - 69\%; F = 0 - 59\%.$$

I round to the nearest whole percent, so for instance an 89.7% rounds up to an A (90%) while an 89.4% rounds down to a B (89%). Students with SRU-documented disabilities should see me ASAP to discuss accommodations for which you have been approved on any of these components to your grade.

HW/Quizzes: I don’t collect HW each day, but will do so on occasion during the semester. I always announce it in advance. Problems will be spot-checked for correctness, honest effort, and completeness. If you have multiple pages, you should staple them (there is a stapler in the front of our classroom and in the Math/Stats Office). You may work together on HW, but do NOT copy from each other nor from the book, class links and PDFs, or other sources - use your own words and organization of work. Any work that looks too identical – even accidentally – will count as a 0 for all involved. Also occasionally we will have in-class quizzes at the start of class, again announced in advance. You may NOT work together on quizzes, and typically everyone at the table will have a different version of the quizzes to maintain honesty. Quizzes and HW are usually graded and ready to return to you at the very next class meeting, but sometimes it may take longer, especially if I have explanations to grade. Again, if I see evidence of dishonesty, everyone involved will get a 0.

Each quiz or homework assignment is worth 5 points (1% of your overall course grade); that doesn't sound like much, but for the semester, I count only your top ten quiz scores (out of 12-14), so diligent, careful students are easily able to earn an entire letter grade in the course through good HW/quizzes. **I DON'T ACCEPT LATE HW/QUIZZES OR GIVE MAKE-UPS** because they make grading criteria less uniform and more importantly delay vital feedback to the rest of the class. However, counting only your best 10 HW or quiz scores allows you to miss a few without hurting your grade. It's like knowing that you have "personal days" to be absent from your job. You don't need to give me a reason or documentation when you miss HW or a quiz, but by missing, you have used up one of your "personal days" whereas a friend may not have, just like at a job. Come in for help beforehand if you have trouble with material on HW or for an upcoming quiz - I hardly ever review before the quiz or HW collection at the start of class.

And to repeat from above, a strong body of research has shown that cell phone use during class - even by strong students - has a negative effect on their learning and performance. For that reason, I am re-instituting a penalty policy similar to those used to deter technology distractions in middle and high school students. Specifically, your cell phone **MUST BE OUT-OF-SIGHT** for the entire class period, whether we are doing lecture or group-work, etc.. If I see it out, or see you glancing furtively toward your lap, side pocket, under your bookbag, etc., I will levy a 2-point deduction on your NEXT Quiz/HW score. Bottom line: phone use in class is proven bad for learning, you're future teachers, and so you need to model good learning habits yourselves.

Exams: Exams require you to solve new problems and explain or apply covered concepts; I don't often reuse problems. You'll get a Topics List naming what's on each exam one week prior to its date; the List does not summarize nor give practice problems (you'll already have your notes and all your HW for that!). Past successful students say the best way to use the Topics List is to make your own study guide, where you copy down precise statements and fully-worked examples as well as cautions about the items listed. This requires you to review your own notes, reading, quizzes, activities, and HW to see what we have said/done about each item. Old exams on my web page are good examples of length or sources of a few practice problems, but they are **NOT** templates for this semester's exams; you need to let this semester's Topics Lists guide your study in order to do well. Each exam takes the whole period. You will be permitted to have your pen/pencil and a calculator out during exams, but nothing else: no cell phones, no water bottles/mugs, and you'll have to put away your calculator cover too. If I see evidence of dishonesty, everyone involved gets a 0.

Final Exam: The Final Exam is cumulative and will have its own Topics List. It takes place in our usual classroom, but on the date and time listed in SRU's official Final Exam Calendar. Honesty is expected, as above. **You MUST take the Final at the scheduled time for your section of the course.** Do NOT plan travel or other activity that conflicts with it; make sure your family and employers understand also. For the 2:00 class, our Final is Thursday, May 10, 10:30-12:30. For the 3:30 class, the Final Exam is Tuesday, May 8, 1:00-3:00 p.m.

Attendance: Attendance, effort, and other subjective considerations do **NOT** count toward your grade. Regular, prompt attendance and meaningful effort to do your best are necessary for learning effectively, so it's artificial to include those as separate point-

earning/losing components of your grade. If you are absent, it is YOUR RESPONSIBILITY to get the notes and materials from a classmate and the web site, make an effort to review them on your own first, and then see me for help – BEFORE the next class. Again, your grade is based on objective standards, so I do NOT give extra credit assignments in the course: this syllabus clearly lists the items and criteria on which you will be graded, and it is unfair to change those after the fact. You should act to meet course standards as we progress; don't beg for special treatment at the end of the course.

Make-Up Exams: Approval to make up a MISSED EXAM SCORE requires that you make meaningful efforts to contact me ASAP when you learn you'll be absent, and provide a documented, University-approved reason for your absence. If approved, be aware that you will NOT take an alternative exam at that time, as you would in a children's classroom. Such a practice delays the return of everyone else's feedback, and at the college level, that's can hurt their learning. Rather, at the end of the semester, if you've been granted a make-up exam opportunity, your Final Exam percentage will also count as your missed exam score from earlier in the semester. As already stated, if you miss handing in a HW or taking a quiz, you will NOT make those up nor turn them in late; instead, I count only your top ten scores to serve as the make-up procedure. Be aware that faculty extend to you the privilege of make-up assignments in certain instances; we are NOT required to do so. You must fulfill your obligations in order to merit that privilege.

Criteria/Expectations: HW/Quiz and exam scores reflect how well you understand the course content, and for me, that means concepts – ideas, relationships, vocabulary, etc. – not just symbolic algorithms – moving numbers around. Therefore, on quizzes, homework, and exams, I expect that you will, among other things:

Show correct, complete work: I often award partial credit for some correct work even with a wrong answer; conversely, if your work for a problem is wrong or incomplete, you will earn very few points even if you got a correct answer in the end.

Explain, when asked: Explanations are a big component of your grade. Students are surprised by the very high quality I require in order to earn full credit on them. Your explanations must aim for the calibre of a teacher explaining the material, NOT of a child explaining his/her thinking: you should be writing about the MATH in a problem, not about yourself. Unhelpful statements such as “I just kept trying numbers until it worked” (how would a child imitate you then?) or mere rephrasings like “ $5 \div 0$ isn't possible because you can't divide 5 by 0” ($5 \div 0$ is read out loud as “5 divided by 0” in the first place, so this person isn't saying anything new) are unlikely to be worth many points. Students ask how much they need to say in an explanation, and my general rule-of-thumb is, when in doubt, DON'T leave it out!

Apply critical thinking: Fully comprehend instructions: what I ask for IS what you'll get points on, no more, no less. I see two kinds of mistakes here: first, sometimes students don't think about or don't understand the ordinary English vocabulary. For instance, the definition of “explain” implies to use words, so if you merely list equations or computations with no verbal discussion to connect them, you will earn 0 points. Second, I assess for teacher-like skills, not child-like skills. So for example if a question says to demonstrate one technique but you show another, again you will get few points because the point of the question is just not to get an answer (sometimes, that's okay from a child), but to demonstrate the ability to adapt your

approach to fit student diversity (necessary from a teacher).

- **Important University-wide policy statement on sexual violence:**

The University requires the following statement to be included in all course syllabi. As future teachers of minor-aged children, you will appreciate the importance of protecting them from harm inflicted by adults. The statement below specifically outlines the University's stance toward sexual violence directed toward minors:

“Slippery Rock University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: <http://www.sru.edu/offices/diversity-and-equal-opportunity/sexual-misconduct-and-victim-resources>. ”