

## MATH 210: Math for Elementary Teachers I - Dr. Miller - Syllabus - Spring 2024

Keep this syllabus with your course handouts. You are responsible for reading it entirely. It is subject to change in serious, extenuating circumstances (as we saw during COVID).

Meeting Place/Times: SPT 130, TR 2:00-3:15 (Section 03, CRN 1819) and TR 3:30-4:45 (Section 04, CRN 2987)

Course Description/Content: (Department-approved Student Learning Outcomes are on the last page.)

- Catalog: *This course is designed for future K-8 teachers to explore number systems (including definitions, operations, and properties of whole numbers and fractions), numeration systems, proportionality, algebraic thinking, and problem-solving. Emphasis is on conceptual understanding in addition to procedural skill.*
- **This course often requires clear, teacher-like explanations and is very VERBALLY oriented.**

Prerequisite: Exemption from or passing grade (D or better) in Beginning Algebra

Follow-Ups: Ask your advisor: most students need MATH 310 next, and you may need a specific grade in 210.

Text: *A Problem Solving Approach to Mathematics for Elem. Teachers* by Billstein, et al. (THIRTEENTH edition)

- The eText is linked in D2L if you have Inclusive Access, but used print copies are okay, too.
- We do NOT use any of the Pearson+/MyMathLab homework or add-ons.

Classroom/learning environment: SPT 130 is a borrowed room - let me know of any issues.

- No food is allowed; I can't allow certain drinks (especially nut-flavored) due to SRU-documented disability.
- See me if these restrictions conflict with your own documented accommodations.
- I teach using at-the-board lecture and group activity hand-outs. Keep each day's items together.
- We'll use name-tents to help my memory and as pockets for your cell phone during class.
- **Protect necessary study time \*outside\* class.** College-level learning is very different from K-12.
  - **You should study 2-3 hours outside class for each hour in class:** the US Dept. of Education \*defines\* ONE credit hour as "One hour of classroom or direct faculty instruction AND a minimum of two hours of out of class student work each week."
  - SRU's Student Success staff say that means you should be studying about 30-45 hours per week.
  - Arrange job hours, family tasks, extracurriculars, etc., to protect the study time you need for success.

Personal Environment: I go by my middle name with friends and Dr. Miller in professional settings, so I am sensitive to what other people want to be called. Please let me know your preferences.

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

- Drop-in F2F office hours are: **MWF 9:00-10:30 am and F 3-4pm**
- Just stop by - no need to call/email. I can also make appointments outside of listed office hours.
- **Course assignments are posted on our web page (not D2L) at [granite.sru.edu/~lmiller](http://granite.sru.edu/~lmiller) .**
  - Each day's post includes: name of topic covered, links to in-class handouts, supporting reading list, list or link of Required Practice and extra practice problems, and due date reminders.
  - I only use D2L for things that need to be private: your grades, DropBoxes, children's samples, etc.
  - **The WEB PAGE is where you should always look for daily class info and materials.**
- Email is my preferred communication with you, and here are some general guidelines:
  - I check SRU email every weekday morning, but I am in class/meetings roughly 12:30-5 daily. I can check afternoon emails when I end the day around 5-6pm.
  - I try to acknowledge emails that same day, but may need another 1-2 business days to take action, depending on time of day, other responsibilities, and whether anyone else must be looped in.
  - Evenings/weekends, I try to model professional boundaries and etiquette: neither you nor I should expect replies to after-hours emails, unless we've made prior arrangements.
  - **I will notify everyone ASAP about any unexpected issues for the class; I ask that you do the same (absence, etc.).**
- If we have a course assistant, they'll share their own availability and contact info when finalized.

## GRADING FOR THE COURSE (This is long, but should cover all your questions!)

**General Structure:** Letter-grade cut-offs:  $A = 90-100\%$ ;  $B = 80-89\%$ ;  $C = 70-79\%$ ;  $D = 60-69\%$ ;  $F = 0-59\%$

- Course total = 600 points; I grade by point-count, so your percent is just Points Earned / Points Possible.
- At any time in the course, you can compute that fraction to see where you stand.
- Your grade is based on a mix of formative and summative assessments, described in detail later:  
Required Practice (RP) = 60 pts, Weekly Assessments (WA) = 120 points, Exams 1-3 = 100 pts each,  
Final (cumulative) = 120 pts, OPTIONAL D2L Bonus items (“Study Prompts”) = 12 pts max
- **There are no attendance points nor extra credit opportunities beyond the built-in D2L Bonus.**
- If you miss an assignment/are late, notify me ASAP; missed exams also require external documentation.
- Make-ups never require an extra or later task: dropped scores or substitutions cover that. (See below.)
- If you have an SRU-documented disability accommodation, please inform me during Week 1.

**Formative and Summative Assessment:** what does that mean?

- Assessment refers to any situation where you try to figure out what your students know or can do. It does NOT have to mean “something you grade.”
- Formative assessments help you decide what a lesson or unit should focus on next, what needs more or less attention, or what students are struggling with. It informs your teaching.
- The formative assessments we use in this course include grade-related items such as Required Practice or D2L Bonus, but also ungraded items like math-related conversations with each other during activities, and observations I or a course assistant make during activities or from interactions with you outside class (email, tutoring, office hours).
- Summative assessments are what you use to see what students have learned or mastered after-the-fact; they’re usually obvious. They sum up what was learned.
- Our summative assessments in this course are the Weekly Assessments and the Exams.

**About Required Practice (RP):** 3 pts each, best 20 kept of about 24 possible, so worth 60 course points total

- These are daily “homework” tasks graded only on **completion** and following instructions for format/submission.
- Each day’s web page listing will contain 10 RP problems; some are from the book, some from online PDFs.
- They’re due on the following Tuesday, in a D2L DropBox.
  - They must be in PDF format, since SRU software like D2L (and email) is very bad with photos.
  - See the IATS HelpDesk staff in the library if you need help learning to scan/convert to PDF.
- The written organization for RPs is also very rigid. You’ll get a detailed handout for RP 1.
  - This makes my viewing and scoring as fast as possible, so that you get feedback quickly.
  - For over 100 students this semester, even 5 minutes of feedback per person would take me over 8 hours.
  - Having strict formats and only grading completion means I can cut that to about 2 hours for RPs.
- My **make-up policy** is to drop some RPs, keeping your best 20 of a planned 24.
  - There’s a 5-7 day window to complete each set, so good time management can avoid missing any.
  - If you do miss, email to let me know, but please don’t ask “when can I turn it in?”. You won’t, because I plan to DROP 4 of them; a missed one becomes a 0 that will be dropped.
  - This policy spares stressful schedule crunches when you’ve been absent, and it lets me keep a good flow of feedback to everyone else, uninterrupted by large numbers of exceptions and distractions.
  - If you have SRU-approved accommodations or a chronic situation, do speak with me.
- Feedback is all in D2L, so you’ll see it as soon as I submit it, usually within 24 hours.
- **You may collaborate, get tutoring help, or come to my office hours, but do not COPY from others, the web, books, etc.**
  - Inappropriate collaboration may result in a score of 0 for all involved, regardless of intent.

**About Weekly Assessments (WA):** 15 pts each, best 8 kept of about 11, so worth 120 course points total

- Each WA is a 2-4 page hand-out to work right on that paper and turn in at the start of class once a week.
- I'll distribute the WA handout in class, and you'll usually have 7 days to complete it before it's due.
- WAs are graded for correct, clear, organized work, explanations, and results; just "getting the right answer" is NEVER sufficient.
- As with RPs, my **make-up policy** is to DROP some WAs, keeping your best 8 (of 11-12).
  - If you have a WA finished but will be absent, give it to a friend or email it to me by the start of class.
  - Email me if you'll miss one entirely; expect D2L to show a 0 that will later be dropped.
- I try to return graded WAs the next class day, but it can take longer if I have a lot to read/write.
  - Feedback usually includes individual comments about strengths, errors, or resources to help.
  - Solutions (sometimes partial) will typically be posted outside my office door and on D2L.
  - **KEEP** and study returned WAs and solutions to understand mistakes and avoid making them again.
  - To honor copyright laws and other restrictions, do NOT share solutions beyond our course.
- You may collaborate, or get help from me or tutors, but **do not COPY** from others, the web, books, etc.
  - Lack of academic honesty may result in a score of 0 for all involved, regardless of intent.

**About Mid-Term Exams:** 100 pts each for Exams 1,2,3; timed, in-class, closed book/notes. No collaboration.

- Tentative Exam #1, #2, and #3 dates are posted on the course web page.
  - Exams use the entire period; if you finish early, you can turn it in and leave.
  - Exams are hand-written on paper, and usually have only open-ended questions.
  - Justifications/work are graded on correct MATH knowledge, notation, reasoning, etc., not just effort. Answers without work/support seldom earn full credit.
  - More about my expectations can be found in the Criteria section at the end of this syllabus.
- Midterm exams cover everything since the last exam, but I also give a printed Topics List 1 week in advance.
  - You can use the Topics List to create your own thorough guide, referring to notes, handouts, and problems from RPs, WAs, or extra practice.
  - **Budget your study time to avoid anxiety:** Dancers rehearse dozens of hours for a 5-minute routine; football players practice hundreds of hours for half an hour on the field. A math student will feel more ready for a 75-minute exam if they practice and study (not cram) many hours beforehand.
  - Cramming in the 1-2 days before the exam is very unlikely to earn a good grade. Don't cram.
- **Make-up policy is by substitution:**
  - If you miss/will miss an exam, notify me ASAP and provide external documentation that meets University standards (illness, bereavement, SRU-sanctioned event, etc.).
  - If I excuse your absence, we replace your missed exam score with the percentage you earn on that same material when it shows up on the cumulative Final Exam.
  - This avoids scheduling a separate, immediate make-up test within an already stressful return to class.
- Inappropriate collaboration/dishonesty may result in a score of 0 for all involved.
- Solutions will typically be posted outside my office door and on D2L.
  - To honor copyright laws and other restrictions, do NOT share solutions beyond our course.
- I usually need 1-1.5 weeks to grade exams; I have to read/write a lot to give you meaningful feedback.
  - At best, I can grade 1 exam every 15 minutes, and 15 mins x 100 students = 25 hours of grading. Please be patient for returns that will have meaningful written feedback for you.
  - Study returned Exams and solutions to understand mistakes and avoid making them again.
- Students with SRU-documented disabilities must submit ODS electronic forms one week in advance.

**About the Final Exam:** Worth 120 points; cumulative, timed, in-class, closed book/notes. No collaboration.

- You MUST take the Final at the official SRU-scheduled time: (It's in our regular classroom.)
  - 3:30 Students:** Tuesday, Apr. 30, 1:00-3:00 pm (in our regular classroom)
  - 2:00 Students:** Thursday, May 2, 10:30am-12:30pm (in our regular classroom)
- The Final Exam will have its own Topics List, mostly condensed from those of our Mid-term Exams.

- The Final Exam is hand-written on paper, and has open-ended questions similar to the rest of the course.
- Dishonesty/lack of integrity may result in a score of 0 for all involved.
- Students with SRU-documented disabilities must submit ODS electronic forms to me one week in advance.
- Final exams are not returned to you, solutions aren't posted, and grades typically take 3-5 days to finalize.

**About the OPTIONAL D2L Bonus Study Prompts:** Worth 1/2 pt bonus each, up to 12 points max, untimed

- There will be 25-30 of these auto-scored items in the D2L Quizzes menu, separated by topic.
  - Study Prompts open when or before we cover that topic and stay open all semester.
  - Take them whenever you like; they are auto-graded and show correct answers as soon as you finish.
- They are **OPTIONAL**; you are not required to do any, but past students have liked them for exam review.
  - I formerly used them as required homework, but they didn't serve that purpose well. Strong students appreciated them, though, so I'm converting them to bonus this semester to help everyone!
- Each one where you "score" 3.5/4 or better earns 1/2 pt of free bonus added into your course grade.
  - That sounds small, but earning that bonus on 24 or more different Study Prompts hits the maximum of 12 bonus points, which is a full 2% extra added onto your final course grade.
  - You get an unlimited number of attempts on each Bonus Study Prompt, and can see the correct answers at the end. They use question pools, so don't expect the same questions on every attempt.
  - Due to auto-grading, questions might not seem open-ended, but in fact, most do require the same underlying work as questions from RPs, WAs, and Exams.
- Because Bonus Study Prompts stay open all semester with no due date, there are no make-ups.

**OTHER COURSE POLICIES**

**Attendance and Help:**

- A sign-in sheet circulates daily for SRU records, but attendance does NOT count toward your grade.
  - If you are absent, get the notes from a **classmate**. This is **YOUR** responsibility. (To maintain the flexibility we need daily, I lecture from an outline, so I don't \*have\* written notes or slides to xerox.)
  - You can get all handouts and see assignments on the course web page via [granite.sru.edu/~lmiller](http://granite.sru.edu/~lmiller)
- **SEEK HELP EARLY AND OFTEN!** Don't wait until your grade is at risk.
  - You can get help from me during office hours or by appointment.
  - If we have a course assistant, they may also hold free tutoring hours just for our course. (to be posted)
  - The Math/Stats Assistance Center (MAC) has free walk-in tutoring Mon-Thurs 5-10pm in VSC 103.

**Calculator Policy:**

- You need a calculator for the course: a 4-function calculator that can take square roots is good enough.
  - Some of the cheap stores in/around SR have calculators like this for \$1-2. See me if cost is an issue.
- Higher-level calculators are ok during lecture, but ones with alphabet keys are forbidden on quizzes/exams.
  - Most graphing calculators have alpha keys, so try to buy or borrow something simpler.
  - You CANNOT use your cell phone in this class at all, due to the risk of distraction.
- If you're unsure whether your calculator is acceptable, check with me in advance.
- For exams, calculator covers need to be removed and put away.

**Student Learning Outcomes - SRU Department of Mathematics - Effective Spring 2022**

1. Students will apply problem-solving and algebraic thinking skills both in computational and explanatory settings.
2. Students will demonstrate a mastery of operations and other manipulations involving number and numeration systems.
3. Students will demonstrate a command of definitions and properties relating to number systems (whole numbers and fractions) and numeration systems both in computational and explanatory settings.
4. Students will be able to explain concepts and processes at an appropriate level for elementary students while maintaining mathematical accuracy.

## DEEPER INFO ABOUT UNDERLYING COURSE POLICIES AND RATIONALE

### • 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, probability/statistics, and a little measurement/geometry taught in Grades preK-8 (but mostly K-5). It's not a methods/ "how to teach" course, though it does offer some insight; it's deep study of the actual 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 the preK-8 range: the most effective teachers have broad views 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 and the Pennsylvania Department of Education require you to take courses in many different areas that your students will learn, even though you yourself might not teach those subjects. It's also \*very\* common for school districts to reassign teachers to different grade levels or subjects as enrollments change, so you need to be thoroughly prepared for all subjects and grade levels that your certification indicates.

**Pedagogy:** We focus on developing YOUR deep understanding and analytical thinking applied to the math concepts that appear in teaching children's level mathematics. A teacher's skills must go far beyond blindly mimicking a list of steps from a teacher's manual, and the variety of needs among your own future students require you to use critical and flexible thinking, which puts YOUR learning in this course at a very high level in Bloom's Taxonomy. Prepare to study hard.

The content in this course is very conceptual, rather than just procedural/just-follow-the-steps, and that can be challenging and frustrating, especially if you've mostly been taught procedurally in your youth. 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 can be found in the section on Criteria.

### • Some Info about Learning, Study Skills, and Performance Expectations

**About Taking Notes:** Many research studies are showing that students who take notes by hand learn and retain information better than those who try to type on a laptop or avoid note-taking at all. I use the board a LOT to model how to organize your thoughts as you learn, But don't slip into thinking that you should only write whatever I write. Rather, as I or 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.

**Phone use during class** - Very recent research is proving that cell phone use during class has a negative effect on learning, performance, attitude, and focus, even for strong student who think they can "multi-task." That's because the research is also finding that putting your thoughts in and out of the learning environment during a class period makes it harder to fully connect ideas. As teachers, you will need to make and keep track of connections in your material and for each child's needs. If you need your phone handy for a personal situation, talk with me in advance; otherwise, keep it put away. We'll be making name tents to help me call on you regularly, and using those as cell phones pockets is a great way to get used to a possible policy for your own classrooms, schools, or meetings. Bottom line: phone use in class is proven bad for learning and you're future teachers, so model good learning habits starting now.

**Advice about Test Anxiety:** Some students are really nervous about tests, especially in a math class. In some cases, that can be simply because no one has helped them recognize good ways to prepare. One big thing to consider is TIME. When I was in marching band, we would spend 15 hours rehearsing before our first (very simple, in those days) 15-minute half-time show. We were probably still a little nervous, but imagine if we had rehearsed only ONE hour for that show! We'd have been petrified! Now imagine that you're studying for a 75-minute exam. If you study just 2-3 hours, you are naturally going to feel really scared, because your instinct knows you aren't really prepared and rehearsed and able to remember everything, while your conscious mind is giving high-fives for that 2-3 hour session you survived! Certainly, everyone's prep time is different, but try to give yourself a chance to NOT feel lost and uncertain and jittery and anxious; don't make yourself that performer who didn't get enough rehearsal time to know their show yet. And spread your study out across the week leading up to the exam also, so it's not one big, impossible block of time to squeeze in somehow.

**Form a study group:** Another big thing I hear from lots of students is that studying together really helps. Making a regular time to get together as a group can help you keep accountable to study, and talking about

material with other people can give a new look at something that had you confused, whether you're a listener or a speaker in the group. I have had several students this past year who told me what a big difference it made when they started or joined a study group, and I could often see that difference in their grades!

**Criteria/Expectations:** Summative assessments in the course display your understanding of our content, and that means concepts – ideas, relationships, vocabulary, justification, structure, etc. – not just mechanical steps that move numbers and symbols around. I expect high-level, future teacher work and understanding, not child-level functioning. Therefore, on class tasks, 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 is wrong or incomplete, you'll earn very few points even if you got a correct "answer" in the end. Also be sure that you actually answered the question or drew a conclusion. For instance, if a problem asks you to find a total number of people, and you only tell me about separate numbers of adults versus children, you didn't complete the task and won't get full credit.
- **Explain, when asked:** Explanations are a big component of your grade, and explanations ALWAYS use words. Just "showing your work" is not the same as explaining and usually won't earn any explanation points. Students are also surprised by the very high quality I require in order to earn full credit on explanations. You must aim for the calibre of a teacher explaining the ideas, NOT of a child explaining his/her thinking: put another way, 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 by 0" ( $5 \div 0$  is read out loud as "5 divided by 0" in the first place, so this example 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, I often ask for "complete" number sentences, but if you haven't practiced problems enough to really seat that word for yourself in our context, you can easily come up short. 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 not just to get a final answer somehow (which may be okay for a child student), but to demonstrate the ability to adapt your approach and have a large and varied toolbox of skills to fit your future students' diversity (necessary from a teacher).
- **Behave with integrity:** In your professional life, the people you deal with will expect you to be honest with them, to maintain standards, and not to cut corners. Establishing those traits early and solidly is important, so I will expect such behavior of you in this class. Being honest and not cutting corners in a class means doing your own work on assignments, not just copying from a friend or worse, cutting-and-pasting from the web - that's plagiarism! It means not trying to give yourself an unfair or impermissible advantage on exams or quizzes through things like crib sheets, web helps, etc. Being honest obviously includes not giving a false or unfairly exaggerated reason to try to get a make-up or extension on a task. Maintaining standards as a student means not doing someone else's work for them while letting them turn it in as their own. SRU's policy on academic integrity is at [rockpride.sru.edu/policies/#search=integrity](https://www.sru.edu/policies/#search=integrity). The University expects that students will demonstrate their mastery of subject matter (in our case, skills, outcomes, and knowledge in our course) in an honorable and straightforward manner.

#### **Important University-wide policy statements**

**Title IX:** Slippery Rock University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, 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: <https://www.sru.edu/offices/human-resources-and-compliance/sexual-misconduct-and-title-ix-resources>.

**Non-discrimination:** Slippery Rock University of Pennsylvania does not discriminate on the basis of race, color, sex, sexual orientation, gender identity, gender expression, national origin, religion, age, disability, or veteran status in its programs or activities in accordance with Title IX of the Educational Amendments of 1972, the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Title VII of the Civil Rights Act of 1964, and other applicable statutes and University policies. <https://www.sru.edu/offices/human-resources-and-compliance/notice-of-non-discrimination>.