Meets: Monday and Wednesday 3:30-4:45 pm in VSC 203

Special Meeting Note: Under a 2-hour campus delay, we meet starting at 3:15 for TWO short periods.

Content: Survey of measurement, Euclidean, and motion geometry for Liberal Studies and future teachers

Prerequisites: Exemption from or passing grade in ACSD 110 (Beginning Algebra)

Texts: *A Problem Solving Approach ...* by Billstein (11th ed)

Contact Info/Extra Help:

- Email: lyn.miller@sru.edu - Phone: 724-738-2878 - Web: granite.sru.edu/~lmiller (not D2L)
- Office Hours: VSC 200B - Drop-in: M-F 8:30-9:30 - also by appointment
- Some tutoring's available from Tutoring Center in Library or Math Assistance Center in Vincent.

Classroom environment:

- Don't use your cell phones, don't distract others, and you may collaborate, but don't copy.
- You may use a calculator other than your cell phone. Don't forget it for exams!
- I **CANNOT ALLOW FOOD/DRINKS** due to serious allergic reactions.
- See me if this restriction conflicts with your own documented accommodations.

Grading: $A = 90.0 - 100.0\%; B = 80.0 - 89.9\%; C = 70.0 - 79.9\%; D = 60.0 - 69.9\%; F = 0.0 - 59.9\%$.

- Course total = 500 points: HW/Quiz Score = 50 pts, Exams 1-3 = 100 pts each, Final = 150 pts
- I don't give attendance or "effort" points nor extra credit opportunities.
- Some required criteria for your work in general are in the expanded syllabus. READ THEM!
- Students with SRU-documented disabilities should notify me during the first week of class.

HW/Quizzes: Worth 50 points total: best 10 out of 12-15 at 5 points each

- Quizzes or HW collection will be announced in class. See me in advance for help.
- You may work together on HW, but DON'T COPY! You may NOT work together on quizzes.
- NO late/make-up assignments - I count only your best 10 to allow for a few missed.

Mid-Term Exams: Worth 300 points total: 100 each for Exam #1, #2, #3, no collaboration

- Topics List provided in advance – Study thoroughly, based on that List.
- Answers without work do not earn full credit. Explanations must also be thorough.
- Explanations/work are graded on correct MATH knowledge, not stream-of-consciousness or "effort."
- Make-up exam approval requires prior notification, and documentation. The Final is your make-up.
- Tentative dates – Exam #1: 2/19, Exam #2: 3/26, Exam #3: 4/30
- Students with SRU-documented disabilities must submit exam paperwork one week in advance.

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

- You MUST take the Final at the scheduled time: Friday, Dec 13, 1-3 p.m.
- 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 BEFORE the next class.
- Assignments and announcements are available via my web page granite.sru.edu/~lmiller.

**The full SYLLABUS follows and describes my course policy in greater detail.
YOU ARE RESPONSIBLE for reading it in its entirety.**

Student Outcomes - Math 118
Elementary Geometry
(SRU Department of Mathematics - Spring 2014 PDF version)

1. Students will demonstrate an understanding of and ability to work with basic ideas of geometry. This includes the following topics:

   (a) Points, lines, planes and their relationships and properties

   (b) Angles and angle measurement

   (c) Line and angle relationships

   (d) Basic geometric figures and their hierarchy

2. Students will demonstrate an understanding of and ability to work with polygon relationships. This includes the following topics:

   (a) Congruent and similar triangles

   (b) Types of triangles and quadrilaterals

   (c) Properties of special triangles

   (d) Regular polygons

   (e) Symmetry of polygons

3. Students will demonstrate an understanding of and ability to work with constructions using straight edge and compass. This includes the following topics:

   (a) Segment and angle bisection

   (b) Copying segments and angles

   (c) Perpendicular and parallel lines

   (d) Medians, angle bisectors, altitudes, and side bisectors of triangles

4. Students will demonstrate an understanding of and ability to work with motion geometry and tessellations. This includes the following topics:

   (a) Translations or slides

   (b) Rotations or turns

   (c) Reflections and glide reflections (coordinate geometry)

   (d) Size transformations

5. Students will demonstrate an understanding of and ability to work with geometry in three dimensions. This includes the following topics:

   (a) Regular polyhedra

   (b) Relationship between edges, faces, and vertices of polygonal figures

6. Students will demonstrate an understanding of and ability to work with measurement. This includes the following topics:

   (a) Linear measurement

   (b) Area of polygons and circles

   (c) Pythagorean theorem

   (d) Surface area

   (e) Volume and mass

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

  <u>Content:</u> MATH 118 is a survey of measurement, Euclidean geometry, and motion geometry intended to expand general knowledge for all college students and strengthen content knowledge for future K-8 teachers. "Elementary" in the title does NOT mean the material is presented at a child's level, but rather that the concepts are foundational. Computation and classification are required, but so is logical reasoning and explanation.

  <u>Rationale:</u> You'll learn specific geometry concepts in this course but also expand your overall critical thinking skills. Specific formulas and facts <u>may</u> appear in your life after this class, but the ability to reason and communicate in a logical and clear fashion <u>definitely will</u>: all of you will in your careers need to communicate clearly with others (students, coworkers, or clients), share your reasoning and understand theirs, and contribute to classroom or business/professional problem-solving efforts.

  <u>Pedagogy:</u> 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 many class days. I call on individuals or groups often to share ideas. Also, you'll learn to explain WHY certain math concepts work; simply crunching numbers in formulas isn't sufficient to engage the critical thinking we strive for.

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

  <u>Physical Environment:</u> We meet MW 3:30-4:45 in Room VSC 203. Under a 2-hour campus delay, we meet starting at 3:15 for TWO short periods. 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.

  <u>Cognitive Environment:</u> Your future careers will likely involve interacting with others who know less than you about some topics, so respect the process of learning and collaboration: **don't use cell phones** or other technology during class, and **don't distract your classmates** with off-topic conversation. Begin **now** to think about learning, communicating, and successful group dynamics as the professionals you will soon be; your days in the role of student are ending. I encourage collaboration in and out of class, but that 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, in your own classroom, or when asked to lead or contribute to a work initiative.

  <u>Health Environment:</u> <u>I **CANNOT PERMIT FOOD OR DRINKS**</u> in our classroom due to serious respiratory allergies. Unflavored water is allowed, but no other beverages. See me immediately if this health accommodation conflicts with your own documented needs. In your future profession, you will likely be involved in implementing accommodations (often called "ADA accommodations" in the workplace or "504 Plans" in the schools) for people with disabilities with whom you must interact; federal law protects the rights of the disabled, including those with health disabilities. Start now to become more aware of such situations.

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

  Pre-/Post-Requisites: The course prerequisite is exemption from or passing grade in ACSD 110 (Beginning Algebra). MATH 118 meets the Liberal Studies Math Goal requirement. It is required for some education majors and minors (ask your advisor).

  Texts: Our text is the purple/green 11th edition of *A Problem Solving Approach to Mathematics* by Billstein, et al. The Billstein text is also used for in MATH 210-310; older editions may have different problem numbers, so use them at your own risk.

  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.

  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. 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; 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 can't leave the room; for homework I'll sometimes instruct you in making your own substitutes or using online versions.

- **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. You should make a good-faith effort to organize your thoughts before seeing me, however. The student who comes to me asking for help or extra practice with a specific problem or topic will benefit much more than the student who has not tried to study for days and simply says "I'm lost; can you teach me everything again?"

  Office Hours and Contact Info: My drop-in office hours for Spring 2014 are M-F 8:30-9:30 am. We can also make an appointment to meet at other mutually convenient times. My email address is **lyn.miller@sru.edu**; my office phone number is 724-738-2878. My office is 200-B VSC inside the Mathematics Department office suite, but please do not bring food or beverages into my office.

  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 Dept. The Tutoring Center can assign you an individual or small group tutor, but there are limits to how often you can meet each week. Math 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 this course. The MAC is a walk-in service held in our classroom VSC 203, Monday-Thursday nights: look for times on this semester's flyers. The tutors rotate but are math majors, and some have taken MATH 118, so ask when you arrive. 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.

- **How Your Grade Is Determined**

  <u>**Overall:**</u> Your grade for the course is based on frequent collected homework or 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:

  $A = 90.0-100.0\%; B = 80.0-89.9\%; C = 70.0-79.9\%; D = 60.0-69.9\%; F = 0.0-59.9\%.$

  Students with SRU-documented disabilities should see me ASAP to discuss accommodations for which you have been approved on any of these grade components.

  <u>**HW/Quizzes:**</u> This semester, I'm incorporating both collected homework and in-class quizzes into your grade. Sometimes, they may be unannounced. Come to class each day prepared to turn in your HW from the previous lesson - you must show WORK for full credit on graded problems. Staple your HW; the Math Office in VSC 200 has a stapler if you forget. Graded problems may be randomly chosen; your score is based on correctness and completeness. You CAN work together or with a tutor on HW, but any work that looks too identical – even accidentally – will count as a 0 for all involved. Quizzes, on the other hand, will always be solo efforts. They too will cover material from the previous lesson and may include HW problems. Some quizzes may be open book; some may be take-home. Each quiz or collected HW 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 scores (out of about 15), so diligent, careful students are easily able to earn an entire letter grade in the course from good HW and quizzes. **I DON'T ACCEPT LATE ASSIGNMENTS** – they make grading criteria less uniform – but counting only your best 10 scores allows you to miss handing in a few without hurting your grade, much like taking a personal day at work.

  <u>**Exams:**</u> Exams require you to solve new problems and explain or apply covered concepts; I don't 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. 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.

  <u>**Final Exam:**</u> The Final Exam is cumulative and will have its own Topics List. It is administered in our regular classroom, but on the date and time specified in SRU's official Final Exam Calendar. Our Final Exam is Friday, May 9, 1-3 p.m. **You MUST take the Final at the scheduled time.** Do NOT plan travel that conflicts with it.

  <u>**Attendance:**</u> 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 RESPONSI-BILITY 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-Ups: Approval to make up a missed EXAM score requires that you make meaningful efforts to contact me immediately when you learn you'll be absent, and provide a documented, University-approved reason for your absence. If approved, you will NOT take an alternative exam at that time; this practice delays the return of everyone else's feedback. Rather, at the end of the semester, your Final Exam grade will also count as your missed exam score. As already stated, if you miss handing in a quiz, you will not make it up or turn it in late; instead, I count only your top ten scores. 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 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 explain the MATERIAL and not resemble those 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 client understand your process, or how would your own students 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" 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 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 am assessing professional-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 (that might be okay from a child), but to demonstrate the ability to recognize and apply diverse approaches to a task (necessary from a professional).