

Course Syllabus
Math 3703-91: Geometry for P-8 Teachers
Summer Session II, 2019
University of West Georgia

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Office Hours: TBD

Class Meetings: *T, Th* 11 a.m. – 1:30: p.m., Newnan Center 131
These will consist of a combination of lectures, question-and-answer sessions, hands-on experiments, and general discussions. All reading will be assigned in advance of the meeting thereon. (See attached schedule.)

Text/Resources: Billstein, R., Libeskind, S., & Lott, J. (2016). *A Problem Solving Approach to Mathematics for Elementary School Teachers*, 12th Edition, Chs. 11 – 14; Pearson, Boston, MA. ISBN#: 0-321-98729-2

Compass, straight-edge and protractor

Calculator (TI-30 or better)

Prerequisites: Admission to Teacher Education program and Math 2008 with a minimum grade of C or Math 1634 or Math 2703 and Math 2008 with a minimum grade of C

Catalog Description: Special emphasis for teachers of grades P – 8. Logic; real numbers; basic and transformational geometry; measurement, including the metric system; problem solving; methods and materials for teaching mathematics at the P-8 level; a continuation of Math 2703.

Topics: *Geometrical Figures* (Ch. 11; 2 weeks): Points, lines and planes; collinearity, coplanarity, skew and parallel lines, perpendicularity; circles and angles; plane curves and regions, polygons (triangles, quadrilaterals, etc.), regular polygons, symmetry; surfaces and solids, convex polyhedra (prisms, pyramids, etc.), regular and semi-regular polyhedra, nets, Euler's formula; cylinders, cones, and spheres.

Geometrical Constructions and Transformations (Chs. 12 - 13; 3 weeks): Congruent figures (especially triangles); construction of bisectors, altitudes, polygons, inscribed and circumscribed circles, etc.; similar figures (triangles, rectangles, etc.), mean proportions, golden rectangles; constructions via translation, rotation and reflection; tessellations.

Measurement (Ch. 14; 3 weeks): length (linear units, distance, perimeter, circumference, arc length, etc.); plane area (square units, rectangles, triangles, polygons, circles, and sectors); Pythagorean Theorem, measurement in a coordinate system (distance and slope, equations of circles and lines); surface area and volume (cubic units, prisms, pyramids, cylinders, cones, spheres and tori); other physical quantities (mass, density, temperature, etc.)

General Objectives: Besides developing and deepening your understanding of the topics mentioned above, there are some general skills you should improve upon along the way in order to be able to carry what you learn in this course into future courses of study and teaching. These include:

- use of appropriate mathematical terminology and notation
- use of geometrical tools of construction and measurement
- appreciation of the nature of and relative logical roles role played by undefined terms, axioms, definitions, and theorems in geometry
- appreciation of the difference between geometrical intuition and logical proof
- grasp of the general concepts of dimension, shape, size, measure, congruence and similarity
- translation of practical problems into geometrical models and vice versa

Evaluation Procedures: Your understanding of the material and your progress toward the aforementioned objectives will be evaluated on the basis of your *contributions to class meetings and performances on three written exams*. (See attached schedule.) Practice problems from the text or from class will be assigned regularly but not collected or graded. These are for self-evaluation and class discussion. Be prepared to discuss them as soon as possible after they are assigned. [Note: Exam problems will be based directly on homework problems!] There will also be numerous opportunities to earn extra credit for well-written solutions to selected problems related to the homework and class discussions.

Evaluation Criteria: Grades on all work will be based upon

- accuracy of information (including calculations and use of mathematical symbols and terminology)
- depth and breadth of solutions (when applicable)
- logic and clarity of arguments (when applicable)
- neatness and clarity of presentation
- correctness of grammar and spelling
- thoroughness and timeliness of work
- intellectual honesty and creativity
- achievement of personal potential
- level of difficulty of the material

Grades: My scale for converting numerical grades (i.e., percentage points) to letter grades will be as follows:

89-100 A, 77-88 B, 65-76 C, 50-64 D, below 50 F

Your final grade will be based on *exam scores* (25% each) and *participation in and contributions to class meetings* (25%). Although class participation is more than mere attendance, each day you are absent (in body or mind) from a class meeting, regardless of the reason, you will automatically lose 1 out of the 25 points available.

Important Reminders:

- Attendance is important! However, should you find for some reason that you must miss a class meeting, remember that you are still responsible for any and all material you may have missed during your absence.
- *Exams* must be taken at the prescribed times (see attached schedule), except by permission from the instructor. Such permission will be given only under the direst of circumstances (serious illness, e.g.) and *only if your request is granted before the exam is over. Otherwise you will receive a score of zero for that exam.*
- If you find yourself falling behind in the course, do not delay in seeking out assistance and/or advice from someone (the Instructor, a tutor, etc.) who is competent in the subject area and who has your best interests at heart!.
- All electronic correspondence between student and instructor about matters pertaining to this course should be by way of your UWG e-mail account. In particular, any documents handed out in class can also be obtained from me via e-mail.
- I assume you will abide by the *UWG Honor Code*. This means among other things that you will not submit any work for a grade that is not your own work. Violators of the code will receive no credit for the work in question and, in more serious cases, may be expelled from the course with a grade of 'F'.
- *Disabilities Act/Accessibility for the Course:* If you are a student who is disabled as defined under the Americans with Disabilities Act and require assistance or support services, please notify me and provide me with a copy of your packet from Student Services.