Project 4: Concept Development of Course Topics

In this project, you will research the development of a concept from its early history to today, such as earliest known uses, real-life applications, and high school teaching and learning. The purpose of this assignment is the diverse geometric perspectives of the concept development of a major course topic.

Project Components:

1. **ASULearn select a topic for project 4**

   Using the ASULearn choice feature, select a topic for project 4. There is a limit of 2 people for each topic. If you select the same topic as someone else then you may either work alone or together. The topics are: analytic geometry (with coordinates/metric), area and area measurements, axiomatic systems for Euclidean geometry (synthetically, without coordinates), circles, geometric constructions (including IGS and dynamic geometry), modeling with geometry, parallel postulates, perimeter and circumference and their measurements, polygons, polyhedra (three-dimensional objects), right triangles, similarity, solid figures other than polyhedra (prisms, cylinders, pyramids, cones, and spheres), geometric transformations, or volume and volume measurements.

2. **Historical and Current Perspectives**

   Provide as complete as possible a listing of the major geometric discoveries and geometric development of the topic. The result should be an in depth exploration of the important and interesting geometric events—not the entire history. Be sure to include related geometric images, recent information or applications related to your topic, and contributions from diverse mathematicians. Approximate dates can be noted as ∼1762, by a range of dates such as 1700–1800, or by notations like the 18th century.

   During one class, we will be working on a research guide for project 4, to help you find scholarly information.

3. **High School Connections**

   All of our future intended careers are impacted in some way or another by our past experiences in high school. Research and report back on how your topic arises in
   Common Core State Standards Initiative
   `http://www.corestandards.org/Math/Content/HSG/`
   North Carolina Standard Course of Study Math 1
   `https://files.nc.gov/dpi/documents/curriculum/mathematics/scos/current/math-1.pdf`
   North Carolina Standard Course of Study Math 2
   `https://files.nc.gov/dpi/documents/curriculum/mathematics/scos/current/math-2.pdf`
   North Carolina Standard Course of Study Math 3
   `https://files.nc.gov/dpi/documents/curriculum/mathematics/scos/current/math-3.pdf`

4. **Publication Quality Product**

   You will create a typed two-page or three-page single-spaced product in your own words that is of publication quality and brings together historical and current perspectives as well as high school connections and satisfies the rubric (see below).

5. **Annotated Bibliography (not included in the page count)**

   Use different sources, including scholarly sources. Create an annotated bibliography with annotations explaining how you used each reference in your timeline and where the pictures came from. Use as many pages as you need for the bibliography. Any consistent reference format is fine, although you should try to list authors, even if it is a webpage (sometimes that requires some additional searching, like taking off the end of a web address to see whose page it is, if it isn't listed at the bottom). Try to find the original sources too (for instance, Google is a database and not a source for images). While there are standards in some fields, every journal I submit to has its own specific reference style, but they all do follow these general principals. Rather than in-text citations, an annotated bibliography pushes that information to the end so that the main content is more readable. Here is a sample project from a first-year seminar class with different criteria: `http://cs.appstate.edu/~sjg/class/fs/ResearchProject2Diabetes.pdf`

6. **Research Presentations and Revision Opportunity**

   The research presentation sessions are similar to research day at Appalachian where people are presenting posters, which in turn is similar to research conferences and science fairs. Rather than being at the front of the room with us sitting, you bring printouts to tape up, including the bibliography. I'll supply the tape. You tape up your entire project, including your bibliography.

   On this first day of presentations, to begin with, half the class presents their project to classmates and answers their questions. That typically involves a small group listening to and looking at your project so they can take notes for peer review. Then we'll switch so that the other half of the class has a chance to present too. Thus the entire class can present and conduct peer review on this day. During your session, you must stand by your timeline to discuss your topic and answer questions. If you work with another person, they will be in the other session so you should be prepared to present the entire project. When you are working on peer review, try to spread around so that everyone has someone to present to.

   Between then and the second day of presentations, you have a chance to revise your project. Sometimes it is only after we present and see other models that we have ideas for improvement. Regardless, you'll collate your responses to Project 4, including the annotated bibliography, into one full size multipage PDF for submission to ASULearn. Preview on a Mac or PDFsam on a PC can help collate multiple PDFs into one.

   For the second day of presentations, bring printouts to tape up, including the bibliography. You may bring the original from Monday, or a revised copy, if you made revisions. We'll all take another turn presenting as well as conducting peer review.



https://magicineducation.wordpress.com/2011/03/30/make-your-own-comics-witty-comics/
https://serc.carleton.edu/details/images/15703.html. Photo by Carol Ormand.
http://hosted.jalt.org/pansig/2005/HTML/Bayne.htm

7. **Peer Review and Self-reflection in a Separate ASULearn Assignment**

   During the sessions when you are not presenting, you'll conduct peer review (see below). You reflect on your project after you present (see below). These are collated into a separate ASULearn assignment that you'll share with me only.

Rubric for Grading

clear geometric connections	missing	good/suggestions	exceptional
earliest geometric perspectives	missing	good/suggestions	exceptional
geometric breakthroughs/important events	missing	good/suggestions	exceptional
current perspectives	missing	good/suggestions	exceptional
real-life applications	missing	good/suggestions	exceptional
contributions from diverse mathematicians	missing	good/suggestions	exceptional
related geometric pictures	missing	good/suggestions	exceptional
timeframes	missing	good/suggestions	exceptional
depth of connections	missing	good/suggestions	exceptional
Common Core State Standards Initiative	missing	good/suggestions	exceptional
North Carolina Standard Course of Study	missing	good/suggestions	exceptional
own words	missing	good/suggestions	exceptional
creative & two-or-three-page typed product	missing	good/suggestions	exceptional
professional & flows well	missing	good/suggestions	exceptional
annotated references (not included in page count)	missing	good/suggestions	exceptional
image refs (no annotations needed for pics)	missing	good/suggestions	exceptional
quality references	missing	good/suggestions	exceptional
discussions & engagement at the presentations	missing	good/suggestions	exceptional
peer review	missing	good/suggestions	exceptional
self-reflection	missing	good/suggestions	exceptional

Peer Review

1. Name of the person and the topic.
2. Name the strongest part(s) of their project.
3. Give a constructive suggestion for improvement.
4. What was the most interesting thing you learned from their project?
5. Ask the speaker a question about their project. Write down your question and their response.

Self-Reflection (after you have presented your project)

1. What would you have improved about your project?
2. What did you feel went well?
3. What would you have included with more time and space?