

AI 383 Exploring the World from Different Angles

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Class Day/Time: Wednesdays/6:30-9:30 p.m.
Dates: 04/02 – 06/11
Location: Naperville Campus

Course Description:

This is a new approach to exploring classical geometric ideas. Through it, we seek to strengthen your geometric intuition and make real world connections. Students will participate in hands-on activities that establish fascinating connections between class materials and the historical and practical setting.

This course combines lecture, discussion, small group work, student presentation, and student participation in class discussion. There is no required text. The cost of the Week 4 outing is the student's responsibility.

Writing assignments must be typed and follow the APA 5th edition format. The instructor will uphold the University's guidelines on academic integrity found in the Student Handbook. Students are expected to produce their own writing except when collaborating with others. Students must consult sources outside the class when developing their assignments. When sources are used, students must cite any content they did not personally produce. Using the words of others as if they were your own is called plagiarism and is not acceptable work submitted for this course.

Any late assignments must be submitted prior to the last two weeks of the quarter.

Attendance is required. We will have five class meetings, Weeks 1, 4, 5, 9, and 10. Students missing more than one class throughout the quarter will not pass the course. Please see the instructor about any extenuating circumstances that may threaten your performance in this class.

Evidence All Students will submit:

1. Students will engage in large and small group discussions.
2. Students will participate in group activities.
3. Students will produce two reflections based on group class activities. Students must write about their learning as well as report on the activity.

4. As a group, students will
 - ◆ Design a product
 - ◆ Plan for a 15-minute interactive presentation on what they created, and relate it to their competence.

Competencies Offered:

A-2-C: Creative Expression

Can employ principles of design to enhance the functions and aesthetics of objects or environments.

1. Designs an object or environment.
2. Articulates the elements and principles of the design.
3. Discusses them in terms of aesthetics and function

Students demonstrate this competence by designing an object or environment and articulation the principles of design. It is also essential to explore the relationships between aesthetic issues, function, and the design process.

Assignment:

1. Create a room, design or redesign a room in house.
2. Write a summary on the process involved. Write about your learning, as well as, report on the process, function, and outcome of your design.
3. Give a 10-minute presentation. Have blue print to scale, visual aide, share the process involved, and what the room's function was/is.

A-3-G: Reflection and Meaning

Can assess the assumptions and implications of significant ideas about human experience.

1. Identifies a significant philosopher, theologian, tradition, or thinker's ideas that address the meaning of human experience.
2. Identifies appropriate criteria to assess these ideas.
3. Applies these criteria to the assumptions and implications of these ideas.

Students demonstrate this competence by analyzing the ideas of one or more significant thinkers or traditions about the meaning of some aspect of human experience (for example, friendship, racism, beauty, suffering, hope, sexuality, oppression, etc.). Students will identify appropriate criteria to assess these ideas and their assumptions and implications. Students should reflect on how these ideas relate to their own experiences.

Assignment:

1. Research two mathematicians, one ancient and one modern, who have made a contribution to geometry.
2. Write a 2-4 page biography of the mathematicians. Share the mathematicians' visions, and summarize his/her contributions to geometry/mathematics.
3. Give a 10-minute presentation to class on one of the mathematicians researched and the content of your biography. Share the mathematician's vision, and give insight to his/her contributions to geometry/mathematics.

S-2-X: The Scientific World

Written by student/faculty

Can explore patterns in the natural or man-made world and analyze the process of the chosen design.

S-2 Patterns and Processes

Whether in a distant star or in a microscopic cell, we find in nature repeating forms and functions, together with variations and changes within and among them. The competencies in this group ask students to observe the natural world in order to identify patterns and processes within it. Patterns are observable repetitions in time, space, or organization; process is the means by which patterns are caused or changed. Both are connected with scientific theory, because theories arise to explain, process, or changed. Both are connected with scientific theory, because theories arise to explain pattern, process, or both.

Possible Assignment:

1. Create a tessellation that is inspired by M.C. Escher. Chose some of Escher's works to write a short summary explaining the process by which his and your work was created (include pattern/repetition).
2. Give a 10-minute presentation sharing the process and function of your design.

(OR)

1. Write a 2-4 page paper to show that you can describe the patterns and processes of geometric designs in everyday life.
2. Give a 10-minute presentation sharing the patterns and processes of the geometric design.

F-X: Focus Area

Written by student/faculty

Given the classroom or related experience, the student will choose two of the assessments from the following list with the instructor. The assessments will connect geometric ideas to the student's everyday life.

Possible F/X Assessments

(Choose two from the following or create your own with the instructor.)

Hands of Project	Journal/Written Reflection
Write a Paper	Interpret/Interview/Survey Findings
Responses to Exercises	Case Study
Group Project	Formulate Judgments
Presentation	Construct a Model
Research	Illustrate Something
Experiment	Design a Plan
Solve a Problem	Analyze/Interpret Data or Information

Assessment:	Class Participation/Online Discussion	20%
	Students need to be actively engaged in class discussions and class activities. Students will also be asked to respond to questions online.	
	Presentation of Papers/Projects	20%
	Presentation of papers should include content of papers turned in for assessment. Also part of the presentation should be a reflective component where the student discusses how the student found meaning in the information	
	Content of Papers/Reflections/Projects	40%
	See attached SNL guidelines	
	Group Presentation	20%
	See attached rubric	
	A	90-100%
	B	80-89%
	C	70-79%
	D	60-69%
	F	less than 60%

Week 1

1. Class Meeting
2. Instructors introduction
3. Introduction to syllabus
4. Introduction of students and competencies
5. Locations of Class Outings
6. Art and Man Magazines will be given for reference to online discussion.

Weeks 2 and 3

The instructor will provide students with additional information about various related topics. We will have online discussion on some of the following topics:

1. What is geometry?
2. Application of geometric objects to the real world
3. Egyptians, Babylonians, Greeks
4. Polygons and Triangles
7. Mathematical Projects – Triangular Frameworks and Pythagoras' Theorem in designs for fabrics, wallpaper, tiles
8. When are we ever gonna use this? Careers that use Geometry
9. M.C. Escher – geometric designs by a non-mathematician- Refer to Art and Man Magazine given in Week 1
10. Angles

Week 4

1. Class Outing- Calculating angles on a Pool Table
Group Activity, Class discussion and Written Reflection
We will meet at a local Billiard Room or Indoor Miniature Golf Course. The cost of this outing is the student's responsibility.

Week 5

1. Class Outing- Telemetry of a Rocket
Group Activity, Class discussion and Written Reflection
We will meet at a local park to launch the rockets.

Weeks 6, 7, and 8

The instructor will provide students with additional information about various related topics. We will have online discussion on some of the following topics:

1. Area of a Triangle
2. Quadrilaterals
3. Perimeter and Area
4. Circles
5. Radii, Chords, Diameters, Tangents, Secants
6. Discovering Pi and its History

7. Area and Circumference of Circles
8. Surface Area and Volume of Cylinders
9. Arcs
10. Coordinate Plane
11. Rene Descartes
12. Surface Area and Volume of Prisms
13. Surface Area and Volume of Pyramids
14. Surface Area and Volume of Cones
15. Non-Euclidean Geometry – No Parallel lines
16. Bolyai, Lobachevsky, Gauss, Reimann, Beltrami

Week 9

1. Class Meeting
2. Design a New “Pepsi” Can
Group Activity/Product Development, Class discussion, & Group Presentation
and Reflection

Week 10

1. Class Meeting
2. Presentations of Papers/Projects

Δ The Plan May Change

Oral Presentation Rubric

	4	3	2	1	Total Points
Eye Contact	Holds attention of the entire audience with the use of direct eye contact.	Consistent use of direct eye contact with audience.	Displayed minimal eye contact with audience. Reliance on note cards.	No eye contact with audience. Complete reliance on note cards.	
Clarity	Speech is well understood throughout the entire presentation.	Speech is understood, but not throughout the entire presentation.	Only half of the presentation is able to be understood.	The ability to understand speech is minimal.	
Loudness/ Speed	Speech is at a comfortable volume, and is set at a natural speaking speed.	The volume level is not natural, and the speed of the speech is not consistent.	The volume is too quiet or too loud, or the speech is too fast or too slow.	Volume control and/or a consistent speed have not been achieved.	
Position/ Movement	Speaker is positioned for the audience to see and hear them, and movement is natural.	Speaker's position is starting to distract from the speech, and is becoming unnatural.	Speaker's position is taking away from the speech, and the movements have become repetitive.	Speaker's position and movement took away from the presentation.	
Logical Sequence	Speaker presents information in a way that makes sense to the audience.	Speaker's sequence deviates from the topic.	Speaker's sequence inhibits the audience from grasping main concepts.	Speaker's sequence denies the audience knowledge of the topic.	
Knowledge Of Content	Speaker exhibits command of the material.	Speaker exhibits a working knowledge of the material.	Speaker exhibits a general idea of the material.	Speaker lacks knowledge of the material.	
Fluidity of Presentation	Presentation flows naturally.	Presentation flows, but not completely.	Presentation has minimal flow.	Presentation does not flow.	