Course Policies – Math 122: Math and Art

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Course-Website http://oncourse.wheatoncollege.edu

Class Meetings: MWF 11:30-12:20 in Mars Science Center 1141
Student Hours: M 2:30-3:20, Tu 3:30-4:20, W 12:30-1:20, Th 10:30-11:20
Additional Student Hours: by appointment – just email me!

Textbook: Selected readings, available on OnCourse
Add'l course materials: A ruler with both inches and centimeters; a basic calculator for exams

Overview: In this course, we will explore several math topics connected to visual art, including:

- *Systems of Proportions:* how artists and architects incorporate proportion in their work. including a few specific systems of proportionality developed over the millennia; standards to help us conclude whether it is likely a system of proportions was used in a specific work
- *The Golden Ratio:* learn the ancient roots of the famous constant known as the Golden Ratio (φ); investigate whether φ appears in the Great Pyramid (and through projects, you may investigate various other works); use the geometric concept of similarity to see relate a Greek geometric question to artistic techniques still in use
- *Perspective:* after learning the 3-dimensional coordinate system, use it to develop some very precise rules for drawing with depth; use these ideas both to do some drawing and to investigate the perspective in classic art works
- *Fractals:* after being introduced to self-similarity, fractional dimension, iteration, and complex numbers, see how these ideas lead to some very cool pictures, and create some ourselves; briefly discuss how graphic artists use these concepts to create very realistic images of nature
- *The Fourth Dimension and Non-Euclidean Geometry:* introduce the concept of a fourth spatial dimension and, if time, a type of geometry where the concept of *parallel lines* doesn't exist in the way we are used to; discuss how the cubists were inspired by these ideas

Is this the right math course for you? This course is intended for students who are interested in art or art history. If you are not especially interested in these topics, I'll be happy to help you identify a math class better suited to your interests. The more background you have in art and/or art history, the more you will get out of this class. For that reason as well as the fact that some majors require or recommend specific math courses, it can be a good idea to wait to take this class until you are at least a sophomore.

The only mathematical pre-requisites for this course are some basic algebra and geometry. the only other requirements are an interest in the material, an open-mind, a growth mindset, and persistence.

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Goals and Structure: The main goals for this class are to

- use your interest in art to motivate learning mathematics that can be used to create, analyze, or understand various works of art, thus honing your logical abilities,
- encourage you to appreciate how beautiful math can be,
- illustrate the universality and human-ness of math
- give you a deeper and more layered appreciation for some of the art you see.

For more on these goals and the structure of the course,click here

The national standard is that students spend 2 to 3 hours of work outside of class for every hour in class, so plan to spend *at least* 6 hours per week working on Math in Art outside of class! Some weeks you may work more than 9 hours, while others you may find you do not need to even put in 6 hours.

Communicating with Me: Sometimes students find themselves in a difficult situation and would appreciate a professor showing some leeway in their policies. If you find yourself in such a situation, it is important that you communicate with me. More on this

Intellectual Integrity and the Honor Code: The Wheaton College Honor Code carries certain freedoms and responsibilities for both students and professors. A strong Honor Code gives students academic space to act as true scholars and also can create a strong bond among the student body.

All students are expected to conduct themselves with the highest level of academic integrity, and you are each ultimately responsible for your own learning.

In this class, that means that while you are encouraged to work with other students, all submitted work must reflecty our own understanding, and you should document any support you receive.

It is better for you to turn in an incomplete or not-thoroughly-thought-through assignment than it is to present work that is not your own. In addition to upholding the Honor Code, work that accurately reflects where you are in the learning process gives me a more realistic view of how the class as a whole is doing so I can make necessary adjustments. The penalty for violating the Honor Code on an assignment or an exam in this class is a 0.

Reminder of what you should write regarding the Honor Code on every assignment

How the Honor Code specifically applies to assignments and exams in this class

Connections: This class is already connected to History of Art course ARTH 116: Introduction to Italian Renaissance Art and/or the Visual Art course ART116: Drawing I. It would make an ideal connection with several other Visual Art or Art History courses, and I would be happy to help you formulate a proposal for a student-initiated connection. See what is involved

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Math in Art – Examples in your World: Throughout the semester, keep an eye out for examples illustrating the use of math in art (or of art in math), and set them aside. There will be times during the semester when I ask you share what you have found.

Classroom Community & Engagement: Success in this course won't only come to those who have felt "good at math" in the past – many different collections of assets (strengths, skills, experiences, etc) will combine to bring insight to this course, and we *all* will learn the most when we hear from all voices. And of course, you will get the most out of the course if you feel engaged with the material both in and out of the classroom. For these reasons, my aim is for the class to form a community.

To provide an environment conducive to this, you will get a chance to work with most everyone in the class, and I will provide a variety of participation opportunities.

I look forward to the opportunity to learn from you, and to see how each person's experiences and backgrounds combine with what we are studying to produce a new way of looking at it, and I hope that you will all do the same for each other.

When we are covering material that you think you understand well, please still listen to questions and answers about it: they may reveal a deeper way of thinking about the material to you.

Please also avoid distracting me or your classmates. (Distractions include extended whispering, giggling, and using a computer, tablet, or phone for reasons not directly related to the class)

- *Why I assess classroom community & engagement*
- *How I assess community engagement & participation*

Student Hours & Tutoring: Part of what we hope you learn in college is recognizing when you need support, and how and when to get that support. We do not assume you will learn everything on your own, but we do assume that you will take ownership of your own progress.

Also, one of the primary advantages of coming to a small liberal arts college is the relationships you can form with faculty (and the letters of recommendation we are able to write for the students that we get to know).

For both of these reasons, Come to see me during my Student Hours! Just drop in, no appointment necessary. Come to talk about Math in Art, or anything else!

For a different perspective on the material, and to see learning of this material modeled by another student (who is not a math major or minor), take advantage of the peer tutoring for this course in Kollett Hall

Problem Sets

Most of the focus of this class will be on learning math – and to help you with this, I will be collecting homework. More details on why I collect and grade problem sets

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You will have *weekly* problem sets, due Wednesdays *at 2pm*. The problem sets reflect an entire week's worth of material, and should be worked on steadily throughout the week. Roughly every other problem set will be an individual problem set while the rest will be group problem sets.

More on individual vs group problem sets

Suggestions for working in groups

Guidelines and grading for problem sets

The assignments will be posted online here , which you can get to through OnCourse.

- Late problem sets will have points deducted on a sliding scale:
  More information on late homework
- At the end of the term, I will grade out of 95% of the actual total. That is, if all the assignments together end up totalling 500 points, then rather than grading out of 500 points, I will grade out of 475. (If you earn more than 475 points, the extra points will count as extra credit)

Projects

The focus of this class is on connections between math and art, so you should have opportunities to explore these connections in a more open-ended way than weekly problem sets allow.

Projects that allow you to create art work using the mathematical ideas you've learned will be a fun and challenging way to reinforce the material you've been learning (but there are some less artistic project options as well). These projects will give you a chance to hone your tenacity, ability to connect math and art in a concrete way, time management, and ability to communicate mathematical ideas.

Different projects have different maximum point potentials, and how many *you* earn on your projects will depend upon the extent to which you incorporated math in the work, the correctness and the sophistication of the math you used, the clarity of your explanation, and (if the project involves creating art) the creativity and effort you put in to the art, and to a lesser extent (as this is not an art class) the quality of the art. Keep doing projects until you reach 100 points.

More details on how projects will work

List of projects, maximum points you could earn on each, and their due dates

I will announce in class when a project is within 2 weeks of being due. Most projects will be due on Fridays at 3:00pm.

Late projects will have points deducted on a sliding scale. Click here for details

Extra Credit: There are a few ways to earn extra credit in this class:

- (The most reliable ways) Earn more than 100 points on the projects or more than 95% on the homework
- Find mistakes or make suggestions on how to improve the chapters I have written for this course – the introduction, Chapter 1, and Chapter 2. A non-math related typo=just a few points; a

math related type=several points; a substantive clarification of a mathematical explanation=still more points.

- If there are relevant and accessible math seminars this term, attend one and write a brief description

Exams and Final:

I will give three midterm exams to encourage you to pull together the concepts and skills we have covered. These are designed for you show me how far you progressed in learning the underlying mathematical ideas.

Barring unforeseen circumstances, the exams will be given on Wednesday evenings from 6-8pm; students with accommodations may begin earlier. Look at the syllabus now for the dates, and let me know as soon as possible if you have a conflict. I will not make alternative plans within 24 hours of the scheduled time.

The final will be cumulative and will be 3 hours long. The date and time is on the syllabus; make your travel plans accordingly.

In order to both take the pressure of any one exam and also to encourage you to always see benefits to trying harder next time, the exams will be weighted according to a sliding scale.

The exams are worth a total of 50% of the course grade. Rather than having all the midterms be worth the same amount (for instance 10% of the course grade) and the final worth more (for instance, 20% of the course grade), whichever of the four exams you earn the lowest score on will be worth 8% of your course grade, the next lowest-scoring exam will be worth 11% of your course grade, the second highest-scoring exam will be worth 14% of your course grade, and the highest-scoring exam will be worth 17% of your course grade.

Notify me in advance if you will be missing a midterm exam. If your reason for missing is acceptable, we will arrange that you take the exam **early**. If you miss an exam without notifying me in advance, I reserve the right not to give you a make-up exam. I will not give any student more than one make-up exam during the semester, without extensive documentation of a significant reason backed up by the advising office.

Grade/Pass/Fail: If you choose to use the G/P/F pass/fail grade option for this course and you receive a P (or an F), you will not be able to count the course toward the QA requirement.

Attendance:

As mentioned earlier, once you miss two classes, your absences will begin to count against your participation grade: 1 point for the each missed class,.

Also, much of this course is only available through the classes, so missing class should be avoided. If you **do** miss class, you are responsible for the material that was covered – it is not my responsibility to teach it to you outside of class.

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Accommodations:

Wheaton is committed to ensuring equitable access to programs and services and to prohibiting discrimination in the recruitment, admission, and education of students with disabilities. Individuals with disabilities requiring accommodations, or information on accessibility, should contact Autumn Grant, Associate Director for Accessibility Services in the Filene Center for Academic Advising and Career Services. Email accessibility@wheatoncollege.edu or call (508) 286-8215.

Evaluation

I expect to use the weights below, although I reserve the right to change them if necessary:

Class Participation	5%
Problem Sets	25%
Projects	20%
Lowest-scoring Exam	8%
Second-Lowest-scoring Exam	11%
Second-highest-scoring Exam	14%
Highest-scoring Exam	17%

Note: While getting above 100% on the projects earns you extra credit, there is a limit to its effectiveness. For instance, if your exam average is below 60%, no amount of extra credit will result in your earning above a B in the class (even achieving a B would require an extraordinary amount of effort on the projects that may be better spent spread more evenly throughout the aspects of the course).

Discussing Grades with me: If you question the accuracy of any score or believe I did not see or understand something that you wrote, *of course* I would be happy to look at it again **within a week** of you receiving it. I also welcome discussing the scoring of work (within a week), if your questions are about the nature and nuance of the material and why I considered an explanation to be incomplete or unconvincing.

However, if it seems to me that your goal is neither to point out an error I made nor academic in nature, but simply to get more points, then I reserve the right to lower your score on that assignment, test, or overall total.