COLORADO STATE UNIVERSITY

MATH105: PATTERNS OF PHENOMENA

COURSE INFORMATION

Instructor: Janet Oien, janet.oien@colostate.edu
Meeting Times: Monday, Wednesday, Friday 11:00 AM – 11:50 AM, Engineering B105
Office Hours: Mondays 12:00-12:50pm and Thursdays 10:00am – 10:50am, Weber 207

Everyone learns math differently and learning to ask for help is vital to doing well in both college and life. Plan time to visit office hours for additional assistance and clarification. Get help early and often!

PREREQUISITES

None.

COURSE DESCRIPTION & OBJECTIVES

Applications of mathematical ideas and modes of thought in the arts and humanities, focusing on classification and recognition. Emphasis is placed on exploring concepts through multiple representations to better understand the problem and find possible solutions. Students will be asked to explain their mathematical thinking and reasoning both verbally and in writing.

Possible topics for this course include:

- Math and Art: Patterns and Sequences, Fibonacci Numbers, the Golden Ratio, Fractals, Pascal's Triangle and Symmetry
- Logic and Set Theory
- Voting Theory
- Surveys, Statistical Bias, Visualizing Data and Measuring Variation
- Graphs and Euler Paths
- Probability
- Finance
- Image Processing

Upon the completion of this course, students will be able to:

- Apply mathematical modeling techniques to solve real world application problems.
- Identify connections between patterns, mathematics and art.
- Compare and contrast voting methods used to determine the outcome of an election.

- Apply formal logic and sets to discriminate between valid and invalid arguments.
- Apply probability and statistics to discriminate between valid and invalid conclusions.
- Apply techniques for collecting and visualizing data.

TEXTBOOK / COURSE READINGS

David Lippman. *Math in Society.* This is a free, open textbook available in pdf or MS Word https://open.umn.edu/opentextbooks/textbooks/98

Direct link to pdf: https://www.opentextbookstore.com/mathinsociety/2.4/mathinsociety.pdf

COURSE MATERIALS & EQUIPMENT

A calculator will be helpful for work related to this course. I recommend the Desmos online graphing calculator, which is a free online tool for any homework or classwork. For exams and quizzes, you will need a calculator that does not have access to the internet (cellphones, tablets, and laptops are not allowed during exams).

SUCCESS IN MATH105

In this course you can expect to ask (and be asked) many questions, explain your thought processes and ideas through discussion and writing, and be stretched to think about problems you may have not seen before. Research shows that people learn mathematics best when they are actively engaged in the material with their peers. In other words, doing and interacting, rather than watching, is a more efficient way to learn. Therefore, our course provides opportunities for individual and group work in which you will be actively engaged, solving problems, making discoveries, and connections.

Success in this class means that you must be responsible for your learning and work to develop your understanding of the course material. You must be ready to work hard. Frustration and failure are normal, and often a necessary part, of learning. You are not alone in this journey- you must ask for help and utilize the resources made available. Resources include: your classmates, your instructor, the textbook, practice problems and homework, etc. I have high expectations, but the class is set up so that you can succeed!

GRADING POLICY

The overall course grade is broken down into the following categories:

- In-class Participation (5%)
- Homework assignments (25%)
- Quizzes (10%)

- Midterm 1 (20%)
- Midterm 2 (20%)
- Final Exam (20%)

Your course percentage to letter grade will be no stricter than the following. Plus and minus grades will be up to the instructor's discretion.

90% - 100%	80% - 89%	70% - 79%	60% - 69%	0% - 59%
A	B	C	D	F

PARTICIPATION

Regular attendance and participation is an expected component of this course. Throughout the semester, you will be asked to participate in activities, group work and discussions both during class and online. The goal of these activities is to have you practice new concepts and to learn how to effectively communicate mathematical ideas to others.

HOMEWORK

The goal of homework is to practice concepts and deepen understanding of ideas discussed in class. There will be 8 assignments throughout the semester, occurring every other week. The lowest homework grade will be dropped at the end of the semester.

Most homework assignments will be assigned and turned in through Canvas using MyOpenMath.

It is recommended that you start the assignments early and work on them throughout the two weeks as you encounter new concepts in class. This will give you the opportunity to attend office hours and ask questions about concepts that you may not understand fully. Do not wait until the night before the assignment is due to begin.

Collaboration on homework is allowed and encouraged; however, every student must write and turn in their own work. If you are wondering if you crossed the line, ask yourself "Could I start over and redo this on my own, and would it basically look like this?" If not, then you are submitting someone else's work (plagiarism).

Academic integrity is taken very seriously, so all cases of plagiarized work will receive a 0 and will be submitted to the SRC. I reserve the right to ask you for verbal clarification as to the work you submit for homework, midterms, and the final exam to better assess your understanding of the material. It is my goal to return homework and/or midterms in a timely manner so that you have time to ask questions.

*Keep a copy of all work created for the course, including work submitted through Canvas course learning management system.

QUIZZES

There will be 4 to 5 quizzes throughout the semester, occurring every other week. These quizzes are intended to provide feedback to both you and the instructor.

MIDTERMS AND FINAL EXAM

There are two in-class midterms during the semester on Week 6 (October 3) and Week 12 (November 14).

The final exam for this class is Thursday, December 18th from 4:10-6:10pm.

COURSE POLICIES (LATE ASSIGNMENTS, MAKE-UP EXAMS, ETC.)

Late work will not be accepted unless there is an approved university accommodation.

CSU PRINCIPLES OF COMMUNITY

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

University Policies and Resources

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Colorado State University provides consistent policies relevant to academic courses and resources to support students with various challenges they may encounter. Click the short link (https://col.st/2FA2g) or scan the QR code below for up-to-date information:

Topics include:

- Canvas Information and Technical Support
- Universal Design for Learning/Accommodation of Needs
- Copyrighted Course Materials
- Undocumented Student Support
- Food Insecurity
- Title IX/Interpersonal Violence
- Religious Observances
- CSU Principles of Community
- Diversity and Inclusion
- Student Parents/Guardians/Caregivers
- Student Case Management
- Mental Health and Wellness

ACADEMIC INTEGRITY & CSU HONOR PLEDGE

This course will adhere to the CSU Academic Integrity/Misconduct policy as found in the General Catalog and the Student Conduct Code.

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

Further information about Academic Integrity is available at CSU's Academic Integrity - Student Resources.

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UNIVERSAL DESIGN FOR LEARNING/ACCOMMODATION OF NEEDS

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodation in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from The Student Disability Center may be required before any accommodation is provided.