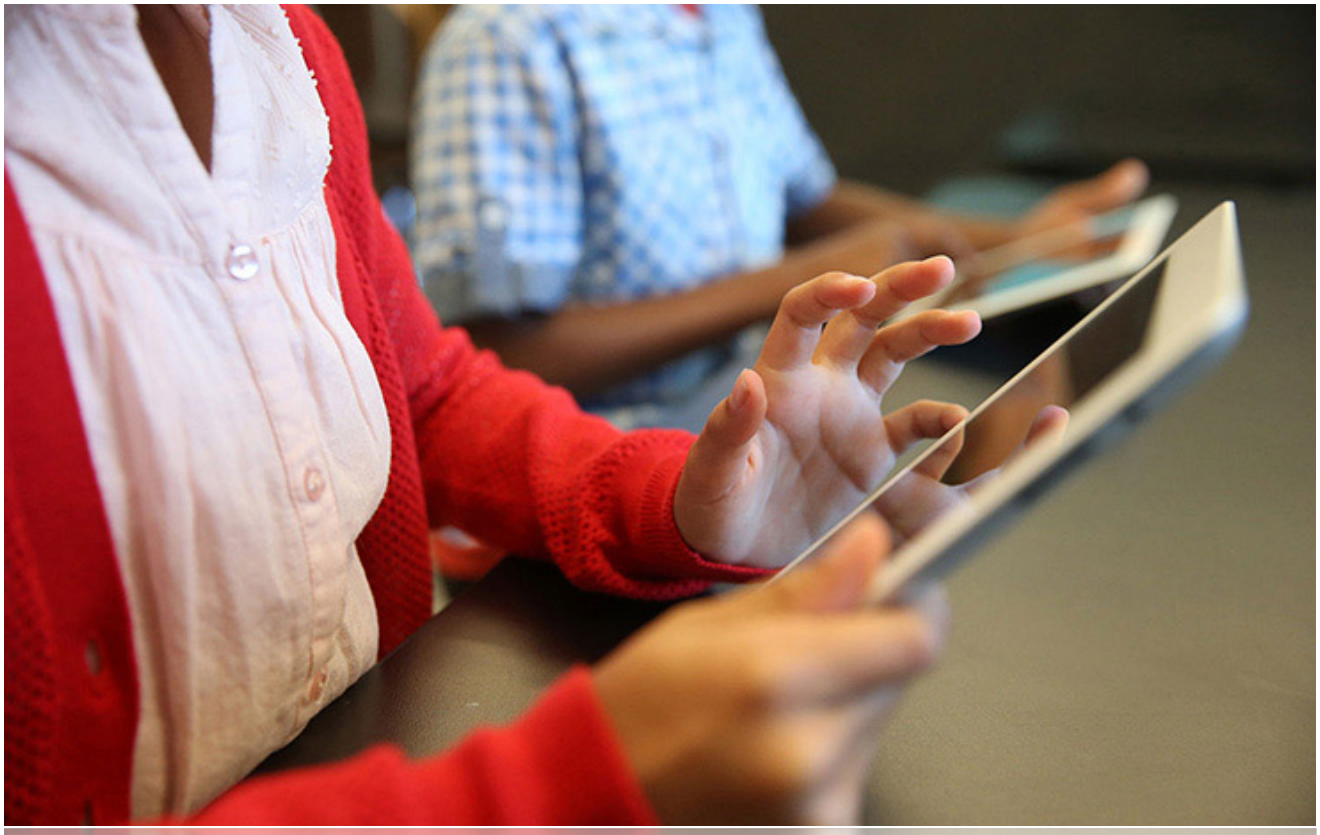
CpSc 2070 - Discrete Methods: Section 1 Spring 2017



Apple Inc.

Just The Facts.....3
What and Where and When 3
Where Can You Find Help 3
What Should Be Your Source For Facts.....3
We Are The Thinkers.....4
Why 4
What is Critical Thinking 4
What Is Your Special Opportunity 4
What Are Specific Course Outcomes 5
What Discrete Math Topics Will Foster The Problems 5
We Will Become Abstract Thinkers 6
How The ClassWork Will Be Organized.....6
How Your Grade Will Be Determined.....7
How Your Journal Should Be Maintained.....7
How Your Journal Submissions Will Be Evaluated 7
Final Grade Determination Using Score.....8
Journal Submissions 8
Description of Journal Entry 8
Specific Journal Entry (Beginnings of an Activity) 9
University Issues 11
Clemson University Disability Access Statement.....11
Clemson University Title IX (sexual Harassment) Statement 11
Clemson University Academic Integrity Statement And Rules 12

Just The Facts

Class: 119 McAdams Hall T TH 9:30-10:455
Professor: Dr. Hedetniemi Email: niemi@clemson.edu
Office: 203 McAdams. 656-5869
Office Hours: 8:30 - 9:15, 10:45-11:00 T TH (others by appointment)

What and Where and When

This course is designed to introduce you to reasoning. The tool is Discrete Mathematics.

119 McAdams Hall T TH 9:30-10:45

Students should walt 15 minutes before assuming that class will not meet. The University is sometimes slow in canceling classes due to inclement weather. Monitor your email from this class.

Where Can You Find Help

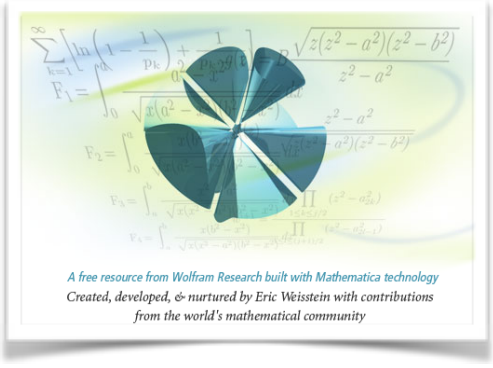
Academic Success Center - TBA
Departmental Help - TBA
Office Hours: 8:30 - 9:15, 10:45-11:00 T TH (others by appointment)

What Should Be Your Source For Facts

We will not be using a textbook. We can find most of the facts that we need at

wolframalpha.com (Siri uses this site)

and mathworld.wolfram.com.



Choose these first.

We Are The Thinkers

Why

This section is part of the University's *Clemson Thinks*[2] community of courses designed to improve the critical thinking skills of Clemson students. Thus, this section will focus on critical thinking and problem solving skills.

What is Critical Thinking

While there are many versions of what constitutes "critical thinking" we will be using a definition proposed by Diane Halpern. These strategies will lead to success in not only this specific course but in all of your computer science courses.

She proposes the following four strategies for "critical thinking"

1. You must be eager to not only to work, but also persist if the problem appears complex.
2. You must be patient and begin with conscious planning.
3. You must be open-minded and flexible in contemplating other's strategies.
4. You must be willing to start again if your plan fails.

What Is Your Special Opportunity

All students in this section ***will*** take a pre- and post-test measuring critical thinking skills. This is an activity for which only you and the institute's director Dr. Knox (Director, Clemson Thinks2 Office Of Undergraduate Studies) will see your results. Results will be in terms of abilities for reasoning skills in several kinds of problems, not a specific "grade".

"One of the most widely held misconceptions about mathematics is that a math problem has a unique correct answer."

Most Math Problems Do Not Have a Unique Right Answer
devlinsangle.blogspot.com - August 1, 2014

What Are Specific Course Outcomes

You will be able to analyze discrete problems using logical mathematical thinking.

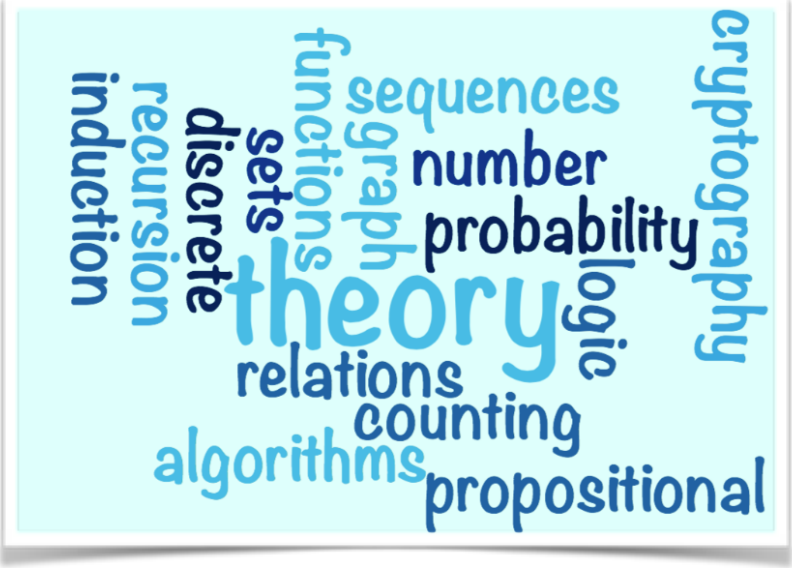
You will be able to produce models to help interpret discrete mathematical problems.

You will be able to apply critical reasoning expressed in discrete mathematical vocabulary to justify your approach to these problems as well as to justify your proposed solution.

You will be able to implement simple proof techniques.

You will be able to apply "counting" in appropriate discrete mathematical problem solutions.

What Discrete Math Topics Will Foster The Problems



We Will Become Abstract Thinkers

"If you want to prepare people to design, build, and reason about formal abstractions, including computer software, the best approach surely is to look for the most challenging mental exercises that force the brain to master abstract entities — entities that are purely abstract, and which cause the brain the maximum difficulty to handle. And where do you find this excellent mental training ground? In mathematics."

The Importance of Mathematics Courses in Computer Science Education
devlinsangle.blogspot.com - April 1, 2015

How The ClassWork Will Be Organized

The class will be problem-based. **Class Attendance** is not only important to accomplish the goals of the learning strategy, but is **required to further your understanding of "math explorations"**. You must be prepared to determine what you missed without consulting me.

Work, in the form of a journal, will be submitted through Canvas as a PDF document on specific days scattered in the term. Late work will not be accepted nor will submissions other than through the Canvas link. Keep pace with the activities. There will be a **final exam submission**.

You should bring your computer to every class. Class activities will be accomplished in groups. Students who participate in a group typically make more progress than those students who work by themselves in class.

How Your Grade Will Be Determined

Activity	Grade Percentage	Dates
First Journal Submission	10%	Jan 28, 11:59 PM
Remaining (3) Journal Submissions	75% (25% each)	Feb. 25 ; March 25 ; Apr 26 . All 11:59 PM
Final Exam	15%	May 2, 10:30 AM

How Your Journal Should Be Maintained

A Journal Submission ***must*** *contain an entry for every activity* in order to receive a grade higher than a 0 for the submission.

The following standards will be applied to the journal submissions as an entity, not on each individual activity recording.

How Your Journal Submissions Will Be Evaluated

Score		The highest description in which two or more criteria are met
4:		Demonstrates a high level of critical reasoning in exploring/solving problems; Demonstrates growth in use of insightful techniques; Demonstrates a consistent pursuit of learning; Critical reasoning skills have improved substantially over past skills;
3:		Demonstrates an improved level of critical reasoning in exploring/solving problems; Demonstrates insightful techniques; Demonstrates an inconsistent pursuit of learning in these activities Shows some improvement over past critical reasoning skills, but inconsistently;
2:		Demonstrates a level of critical reasoning in exploring/solving problems that is shown by college-level students; Applies standard techniques rather than insightful techniques; Minimally demonstrates pursuit of learning; Shows some small improvement over past critical reasoning skills;
1:		The level of critical reasoning in exploring/solving problems is below the expectation of college-level students Applies neither standard nor insightful techniques to problem; Provides little evidence of pursuit of learning; Shows inadequate reasoning skills with no improvement;

Final Grade Determination Using Score

3.5 and up	A
2.60 - 3.49	B
2.59 - 1.59	C
1.00 - 1.59 :	D
0-.99 :	F

Journal Submissions

Description of Journal Entry

Each entry should begin with the date of the activity followed by the statement of the activity as given. That is, type without copying and pasting, so as to begin the thinking process. Next, restate the problem in your own words but as complete sentences After the "two" versions of the activity statement, include definitions of any words that are unfamiliar, generally of a mathematical nature. Try either wolfram alpha or math world first. Follow this introduction with evidence of your thinking as you attempt the activity. This portion need not be formal but should include enough information to demonstrate your thinking. Color, mathematical diagrams, and symbols, as well as phrases are all useful. If you need to draw on paper, then you should scan, or carefully photograph, your work. Readability is extremely important. This is your mathematical journey — enjoy and document well. The end of the entry should be a paragraph or paragraphs in well-structure English sentences that summarize what you have learned during this journey.

Specific Journal Entry (Beginnings of an Activity)

Activity 0: January 5. Consider the following Shogi game piece. Explore its use in creating shapes.

https://commons.wikimedia.org/wiki/File:Shogi_gyokusho(svg).svg

Restatement of the problem: Assume that we have an unlimited size set of 5-sided shapes equivalent in shape to a piece used in the game Shogi. Discover what we know about the shape and can do with the set of shapes.

Since I have been given the piece, and since I don't need to know the game rules, I do not need to find any definitions.

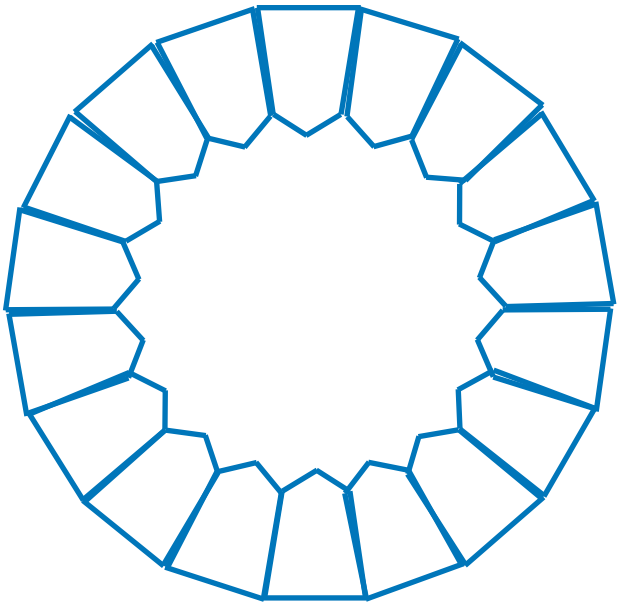
First I clarified that the piece is symmetric:

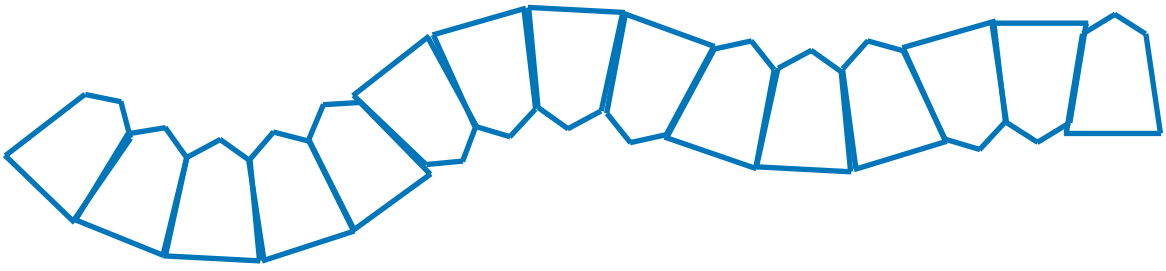
Thoughts on possible arrangements:

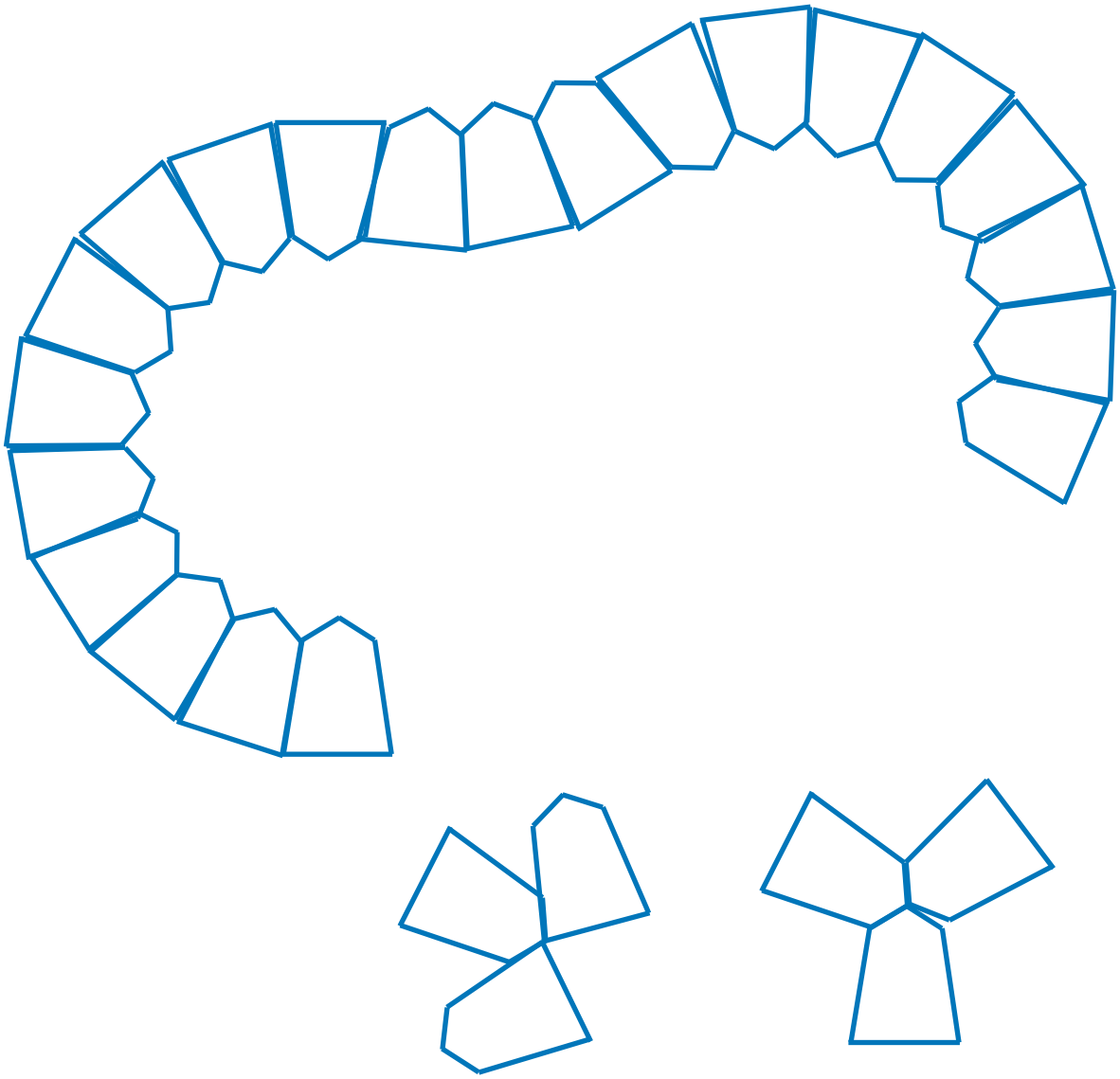
Can some number of pieces be arranged joining the long edges to create a closed shape?

Some 5-sided polygons can tile the plane. Is this such a shape?

Can the pieces be arranged to form a spiral?







I found a closed figure composed of the pieces aligned along the long sides. I really like the inside pattern formed from the peaks. I tried a pattern of 1 up and 2 down and 3 up and 4 down and 5 up. It looks more like a snake than a spiral. So I started with more of the cycle and put in a stutter step. It looks likes this might spiral but not form a regular spiral. My attempts at tiling the plane were unsuccessful.

University Issues

Clemson University Disability Access Statement

"Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if at all possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors" during the first week of class "so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/. "

Clemson University Title IX (sexual Harassment) Statement

"University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at http://www.clemson.edu/campus-life/campus-services/access/title-ix/. Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 110 Holtzendorff Hall, 864.656.3184 (voice) or 864.656.0899 (TDD). "

Clemson University Academic Integrity Statement And Rules

> "As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form."

What Does This Mean

Plagiarism will absolutely not be tolerated! Taking information from any source without acknowledgement is dishonest. Just because information appears online, it is not your's for the taking without giving credit to the person who created the information. If you work with someone else - **by giving information or taking information**, you must acknowledge this sharing of work. If you search for the "answer" and do not acknowledge what you find, you will be considered to have plagiarized. All acknowledgements must appear immediately following the information that is not yours. If it is an exact quote, it must be in quotes. Paraphrasing does not exclude acknowledgements.

Forgetting to acknowledge another's work is an excuse and will not be tolerated.

I will not hesitate to submit your name to Dr. Jeff Appling, Dean of Undergraduate Studies, along with information regarding the alleged charge.

Final Words

Journey: *Think of this as a trek — not a destination*
Truthfulness: *This is your journey; report what you discover*
Creativity: *See math through the wonderment of a child*
Enjoyment: ***HAVE FUN!!***