

## Conference Presentation

**Length:** 15 – 20 minutes  
**Frequency:** One presentation at three venues  
**Value:** 3 points ( $\sim 25\%$  overall grade)

### Presentation Dates

- April 8, 9, or 10: Practice Presentations (to be determined)
- April 11: Doane Symposium
- May 1: NWU Symposium

### Description

You will present on a topic in combinatorics that was not covered during class. Your goal should be to introduce a general mathematical audience to an interesting idea in combinatorics that they may not have thought about before. Refer to the provided rubric throughout the process to help direct your speaking. Some possible topics are given below, but you are welcome to suggest others. Keep in mind that you will expand on this same topic when you write your paper. Contact me once you have selected a topic.

I will meet with you individually four times to help you work on your talk. Each meeting counts toward your daily preparation grade.

- Prior to the first meeting, email me your idea for your talk. What specifically would you like to show the audience in the course of 15 – 20 minutes?
- For the first meeting, come with a written outline of the ideas you would like to discuss in your talk. A good way to approach this outline is to start by choosing one main item (a theorem, technique, structure, example, problem, etc.) that you think the audience will find interesting. Structure your talk in such a way that you are constantly building toward that item, introducing only the definitions and clarifying examples that move you toward your goal.

- For the second meeting, come with a skeletal draft of your slides. It should be complete enough that we have a sense of the overall course of the talk, but perhaps all the details are not in place. For example, you might come in with slides that all have all the titles in place (what that slide is roughly about), the main definitions and/or theorems spelled out, and some idea of what motivating examples you might use.
- For the third meeting, come with a presentation that is as complete as possible. We will work together to make any minor adjustments and fix any code-related bugs.

The entire class will reconvene for practice presentations (time to be determined). You will be given written feedback from the audience to help improve the quality of your presentation. You will be expected to read this feedback and view a recording of your presentation, incorporating your thoughts into a short written reflection. The next presentation will be at the Doane Symposium on Undergraduate Mathematics, which will neither be recorded nor formally critiqued (though you will still be asked to complete a short written reflection). The final presentation will be at the Nebraska Wesleyan Student Symposium, which I will grade according to the provided rubric.

## Sources of Topics

Here are some suggestions to help you get started looking for topics. You are welcome to choose anything you like, so long as it basically falls under the headings of combinatorics or graph theory. If you like, you may choose to make computer programming a part of your project, which would result in a shorter final paper.

### Enumeration

- Our library (third floor, QA164 – QA165)
- Our textbook (topics not covered in class)
- Wikipedia page on combinatorics: [wikipedia.org/wiki/Combinatorics](https://wikipedia.org/wiki/Combinatorics)
- Open Problem Garden combinatorics: [openproblemgarden.org/category/combinatorics](https://openproblemgarden.org/category/combinatorics)

### Graph Theory

- Our library (third floor, QA166–QA167)
- Our textbook (topics not covered in class)
- MathOverflow question about topics in graph theory: [mathoverflow.net/q/64448](https://mathoverflow.net/q/64448)
- Open Problem Garden graph theory: [openproblemgarden.org/category/graph\\_theory](https://openproblemgarden.org/category/graph_theory)
- Wikipedia page on graph theory: [wikipedia.org/wiki/Graph\\_theory](https://wikipedia.org/wiki/Graph_theory)
- Wikipedia list of topics in graph theory: [wikipedia.org/wiki/List\\_of\\_graph\\_theory\\_topics](https://wikipedia.org/wiki/List_of_graph_theory_topics), in particular
  - Cages: [wikipedia.org/wiki/Cage\\_\(graph\\_theory\)](https://wikipedia.org/wiki/Cage_(graph_theory))
  - Random Graphs: [wikipedia.org/wiki/Random\\_graph](https://wikipedia.org/wiki/Random_graph)
  - Snarks: [wikipedia.org/wiki/Snark\\_\(graph\\_theory\)](https://wikipedia.org/wiki/Snark_(graph_theory))
  - Perfect Graphs: [wikipedia.org/wiki/Perfect\\_graph](https://wikipedia.org/wiki/Perfect_graph)
  - Critical Graphs: [wikipedia.org/wiki/Critical\\_graph](https://wikipedia.org/wiki/Critical_graph)
  - Graph Labeling: [wikipedia.org/wiki/Graph\\_labeling](https://wikipedia.org/wiki/Graph_labeling)
  - Graph Pebbling: [wikipedia.org/wiki/Graph\\_pebbling](https://wikipedia.org/wiki/Graph_pebbling)

**Programming**

- Project Euler: [projecteuler.net/archives](http://projecteuler.net/archives)
- Online Encyclopedia of Integer Sequences: [oeis.org/webcam](http://oeis.org/webcam) (Select “Sequences Needing More Terms” from the dropdown menu.)