Math 4321/5321 - Combinatorics
Spring 2025
MoWeFr 2:30 - 3:25 pm in RBN 4019

Instructor:	Dr. Maddie Dawsey
Office:	RBN 4048
Office Hours:	TuTh 8:30 - 9:30 am and We 1:25 - 2:20 am, or by appointment
Email:	mdawsey@uttyler.edu
Website:	All course materials will be posted on Canvas

Textbook
Introductory Combinatorics, 5th edition, by Richard Brualdi. ISBN: 978-0-134-68961-6.

Course Description
Study of combinatorial structures and techniques, focused primarily on enumerative combinatorics.

Course Learning Objectives
By the end of this course, you should be able to do the following:

- Write coherent, concise combinatorial proofs of varying difficulty.

- Apply combinatorial techniques to solve various discrete math problems.

Important Dates

January 20	Martin Luther King, Jr. Holiday - no class
January 27	Census Date
March 17 - 21	Spring Break - no class
March 31	Withdrawal Deadline
April 28 - May 2	Final Exams

Grading Scheme
Your final letter grade will be determined by the following grading scheme:

MATH 4321:		MATH 5321:			
Homework	40%	**Homework**	25%	A	90 - 100
Applications	10%	**Applications**	25%	B	80 - 89.99
Presentation	25%	**Presentation**	25%	C	70 - 79.99
Final Exam	25%	**Final Exam**	25%	D	60 - 69.99
				F	0 - 59.99

Attendance
You are expected to attend every class and participate in any in-class activities. You are responsible for any announcements made during class. If you must miss class, please get any notes you missed from a classmate and email Dr. Dawsey or come to office hours to catch up.

Homework
Homework will be assigned after class each day and will be **due once a week on Canvas, by the beginning of class each Friday**. Students are encouraged to collaborate, but all final solutions must be written individually and in your own words. You must also indicate who you worked with on each problem.

Homework will not be accepted late, and any homework submitted late will earn a grade of zero. If you have to miss or be late to class on a Friday, then it is your responsibility to still turn in your homework by the beginning of class time. Your lowest homework grade will be dropped at the end of the semester.

Applications

Each week, one application problem will be assigned. Applications will generally be challenging and will require you to use the material learned that week to solve a real-world or other type of interesting problem.

MATH 4321 students must choose 2 challenge problems to complete throughout the semester.

MATH 5321 students must choose 5 challenge problems to complete throughout the semester.

Students are encouraged to collaborate, but all final solutions must be written individually and in your own words. You must also indicate who you worked with on each problem.

Applications will be **due on Canvas by 11:59 pm on the last day of class: Friday, April 25**. Applications will not be accepted late, and any applications submitted late will earn a grade of zero. If you have to miss the last day of class, then it is your responsibility to still turn in your applications on time.

Presentation

You will be required to read one textbook section not covered in class, or one published paper in combinatorics, and present the main result to the class. Presentations should be at most 8 minutes long (you will be cut off after 9 minutes) and will take place **during the last week of class: April 21, 23, and 25**. Potential topics, detailed instructions, and rubric will be posted mid-semester. The order of presentations will be randomized, so everyone must have their presentation completely prepared by the beginning of class time on Monday, April 21. Anyone not prepared to present at their assigned time will have 25 points deducted from their presentation grade and will be given another chance to present during the next class period.

Final Exam

There will be a take-home final exam distributed at the end of the last class on Friday, April 25 and **due by Wednesday, April 30 at 4 pm**. If a final exam is turned in after 4 pm on Wednesday, April 30 but before 8 am on Thursday, May 1, then 25 points will be deducted. Any final exams turned in after 8 am on Thursday, May 1 will not be graded and will earn a grade of zero.

Here is the policy for the take-home final exam in this class:

- You may use your textbook, notes, and homework to help you on the final exam. You may not use the internet, and you must please keep collaborations with your classmates to a minimum (see below).

- If you are asked for help on an exam question by one of your classmates, you may give one short, well-thought-out hint or idea that does not give away any of the details of the solution. For example: "Try using the Pigeonhole Principle."

- If you feel like you have to ask a classmate for help with an exam question, you must write that classmate's name next to the exam question along with the hint or idea that the classmate gave you. No points will be deducted for receiving hints.

- Any solutions for exam questions that appear to be partially or completely copied from a classmate will earn zero points for both the copier and the supplier. Any solutions that appear to be copied from an online resource will earn zero points.

Technology

You must have a device capable of internet access, access to Canvas, and either a physical document scanner or a (free) document scanning app. For example, iPhone Notes and OneDrive both have scanning features. Note: Use of AI is not permitted in this class.

University Policies

For university policies concerning Students' Rights and Responsibilities, Grade Replacement/Forgiveness, State-Mandated Drop Policy, Disability Services, Student Absence due to Religious Observance, Student Absence for University-Sponsored Events and Activities, Campus Carry, Social Security and FERPA Statement, please see the University Information module on the course Canvas page.

Tentative Schedule

WEEK	DAY	PLANNED MATERIAL
Week 1 1/13–1/17	M	Chapter 1 Activity
	W	Section 2.1
	F	Section 2.2
Week 2 1/20–1/24	M	*Martin Luther King, Jr. Holiday*
	W	Section 2.3
	F	Finish Chapter 2, **Homework 1 Due**
Week 3 1/27–1/31	M	Chapter 2 Activity
	W	Section 3.1
	F	Section 3.2, **Homework 2 Due**
Week 4 2/3–2/7	M	Section 3.3
	W	Finish Chapter 3
	F	Chapter 3 Activity, **Homework 3 Due**
Week 5 2/10–2/14	M	Section 5.1
	W	Section 5.2
	F	Section 5.4, **Homework 4 Due**
Week 6 2/17–2/21	M	Section 5.5
	W	Finish Chapter 5
	F	Chapter 5 Activity, **Homework 5 Due**
Week 7 2/24–2/28	M	Section 6.1
	W	Section 6.3
	F	Section 6.4, **Homework 6 Due**
Week 8 3/3–3/7	M	Section 6.5
	W	Finish Chapter 6
	F	Chapter 6 Activity, Presentation Topics/Instructions/Rubric Posted, **Homework 7 Due**
Week 9 3/10–3/14	M	Section 7.1
	W	Section 7.2
	F	Finish Chapter 7, **Homework 8 Due**
Week 10 3/17–3/21	M	*Spring Break*
	W	*Spring Break*
	F	*Spring Break*
Week 11 3/24–3/28	M	Chapter 7 Activity
	W	Section 8.1
	F	Section 8.2, **Homework 9 Due**
Week 12 3/31–4/4	M	More Section 8.2
	W	Section 8.3
	F	Section 8.5, **Homework 10 Due**
Week 13 4/7–4/11	M	More Section 8.5
	W	Finish Chapter 8
	F	Chapter 8 Activity, **Homework 11 Due**
Week 14 4/14–4/18	M	Prepare Applications and Presentations
	W	Prepare Applications and Presentations
	F	Prepare Applications and Presentations, **Homework 12 Due**
Week 15 4/21–4/25	M	**Presentations**
	W	**Presentations**
	F	**Presentations**, **Applications Due**, Final Exam Distributed
Week 16		**Final Exam Due by 4 pm on Wednesday, April 30**