

MATH 4091 – 020 – Research on Rainbow Coloring – Spring 2022

Contact Information:

- Instructor: Jesse Taylor
- Office: MCS 219E
- Email: jesse.taylor@angelo.edu
- Our Classroom: MCS 219E
- Meeting Times: 12:00-12:50 Thurs (and maybe Tues)
- Office Hours:
 - Monday: 10:00-11:00am
 - Tuesday: 12:00-1:00pm, 2:00-2:30pm
 - Wednesday: 1:00-4:00pm
 - Thursday: 2:00-2:30pm
 - Friday: 10:00-11:00am, 12:00-1:00pm
 - If the above times do not work please email me to set up another time to meet; virtual office hours are available by request.

Required Textbook

Chromatic Graph Theory, 2nd edition, by Chartrand and Zhang. We will also be studying several academic papers related to the concept of rainbow coloring in graphs.

Homework

Homework will be assigned regularly throughout the semester. In general, I will assign readings and problems each week. It is always your responsibility to attend our meetings and know when an assignment is due and to make sure it is turned in or taken on time.

Tests/Projects

We will have one test/project. It will constitute the “final project” portion of this course and will be taken during our final exam slot or at another time as arranged by the instructor and the student(s) in the course.

The student is also expected to give a poster presentation at ASU’s undergraduate research symposium. This presentation may count as the final project for the course at the instructor’s discretion. The symposium will be held Friday April 29, from 12:00-1:30pm and the deadline to apply is Monday, April 11.

Test	Material Covered	Date
Poster presentation	Cumulative	12:00-1:30pm, Friday April 29
Final Exam	Cumulative	10:30am-12:30pm, Tues May 10

Grading

Your grade in this class will be determined based on the following grading rubric.

- Homework and In-person work: 75%
- Final: 25%

Your final letter grade in this class will be determined based on a ten-point grading scale.

Attendance

Attendance will be taken regularly, and each student's absences will be reported with their final grade at the end of the semester.

Because this is a research course, it is imperative that you attend our weekly meetings. You may miss one class during the semester without penalty, but each missed class after the first will result in a 5% penalty on your final grade (up to 50%).

Technology

Unless you have special accommodations documented with the Student Life office, no cell phones, tablets, laptops, games, or other electronic devices may be used at any time during class or during any test.

Study Aids

Feel free to come by my office for help. I will be in or near my office during office hours (or there will be a note telling you when I will be back). If my office hours are not convenient for you, email me or speak with me during class to arrange another time that is more convenient.

Notes

- If the university is unexpectedly closed for a scheduled class time, whatever was scheduled for that day and/or whatever was due that day will be scheduled and/or due on the next scheduled class day.
- All electronic correspondence will be sent to your ASU email account unless other arrangements are made.
- If you do not receive a graded homework assignment, quiz, or test on the day they are returned, please come by my office during office hours to pick the assignment up.
- Good luck. I want you to succeed in this course. If at any point during the semester you feel as if you do not understand the material, please come talk with me as soon as possible. An ounce of prevention is worth a pound of cure.
- All items and dates in this syllabus are subject to change as the semester progresses. Students will be notified in class of any changes, and the changes will not be updated within this syllabus.

Mathematics 4091 – Rainbow Coloring

Student Learning Outcomes

1. **The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course.** Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in graph theory and, more specifically, for rainbow coloring graphs.
2. **The students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course.** Students will develop and apply the fundamental properties of graphs, graph colorings, and rainbow colorings. Students will also prove basic theorems related to coloring, and attempt to prove new theorems related to rainbow coloring.
3. **The students will apply course material along with techniques and procedures covered in this course to solve problems.** Students will use the facts, formulas, and techniques learned in this course to prove theorems about the structure, size, and nature of graph colorings and rainbow colorings.
4. **The students will apply course material along with techniques and procedures covered in this course to solve problems.** Students will use the facts, formulas, theorems, and techniques learned in this course to prove theorems about the structure, size, and nature of graph colorings and rainbow colorings.

Course Content

We will be using a selection of academic papers on rainbow coloring instead of a traditional textbook for this course.

Anticipated Schedule

Below is a table containing an approximate guide to what we will cover during each class of the semester. These topics are subject to change.

Course Week	Topic
1	Review of graphs
2	Basics of coloring
3	Basics of edge coloring
4	Introduction to rainbow coloring
5	Literature review
6	Literature review
7	Literature review
8	Literature review
9	Proof writing and problem solving
10	Proof writing and problem solving
11	Proof writing and problem solving
12	Proof writing and problem solving
13	Proof writing and problem solving
14	Poster presentation
15	Proof writing, problem solving, and next steps
Final Exam	10:30am-12:30pm, Tuesday May 10

General Policies Related to This Course

All students are required to follow the policies and procedures presented in these documents:

- [Angelo State University Student Handbook](#)ⁱ
- [Angelo State University Catalog](#)ⁱⁱ

Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university's [Statement of Academic Integrity](#).ⁱⁱⁱ

Accommodations for Students with Disabilities

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the

Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#).^{iv} The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)^v for more information.

Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 [Student Absence for Observance of Religious Holy Day](#)^{vi} for more information.

Title IX at Angelo State University

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)^{vii}

Face to Face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website](#).^{viii}

Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)^{ix} web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification on potentially short notice based on developing circumstances.

ⁱ <https://www.angelo.edu/current-students/student-handbook/>

ⁱⁱ <https://www.angelo.edu/academics/catalog/>

ⁱⁱⁱ <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>

^{iv} <https://www.angelo.edu/current-students/disability-services/>

^v <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

^{vi} <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

^{vii} <https://www.angelo.edu/incident-form>

^{viii} <https://www.angelo.edu/title-ix>

^{ix} <https://www.angelo.edu/covid-19/>