MATH 6327 – DM5 – Graph Theory for Educators – Summer 2021

Contact Information:

- Instructor: Jesse Taylor
- Office: MCS 219E
- Email: jesse.taylor@angelo.edu
- Our Classroom: Online
- Meeting Times: Online
- Office Hours:
  - All office hours will be held virtually this semester using Blackboard Collaborate.
  - Times available M-F appointment (email me to set something up)

Required Textbook

A First Course in Graph Theory, by Gary Chartrand and Ping Zhang. There will be readings assigned from the textbook so it is necessary for success in our course. Please do not delay getting the textbook.

Course Content

Selected sections from the text will be covered. An emphasis will be placed on chapters 1-10.

Blackboard

This is an online course. The primary source of information for this course is the Blackboard course that corresponds to Math 6327. All of our course content will be hosted in Blackboard and every graded assignment of the semester will be submitted through Blackboard, so I encourage you to familiarize yourself with our course’s page and its layout. To access Blackboard, navigate to https://angelo.blackboard.com and login using your Angelo State University sign-in credentials. After you are logged in, you should see a link to our course on your home page.

Homework

Homework will be assigned regularly throughout the semester. Our course is separated into seven units. There will be one problem set corresponding to each unit. As soon as you have worked your way through the instructional material you can get started on the problem set. Except in genuinely extreme circumstances no late homework will be accepted (all due dates can be found at the end of this syllabus and on Blackboard). It is always your responsibility to know when as assignment is due and to make sure it is turned in on time.

Lesson Plans

After working through the content in each unit you will create a lesson plan from the material contained in that unit. First note that the goal of these assignments is that after completing the course you will have a collection of ready-made lessons if you ever want to take a week or two and teach your students some basic graph theory. Here are a few things to keep in mind when creating your lesson plans:
• The lessons should be age-appropriate. If you teach middle school, then you should write the lessons for middle-schoolers. If you teach high school, you should make lessons appropriate for high-schoolers.
• Each lesson should be enough for 25-50 minutes of class time. I am allowing a wide range of times because some of the units have more accessible material than others. It is also fine to include examples for your students to work on and students’ work time should be factored in to your time estimates. If you do include such problems, be sure to indicate that they are for student work on your lessons plans when you submit them.
• Each lesson plan MUST include material from the designated unit. It is acceptable to rely on material from previous lesson plans, but do not rely on material that you have not included in your previous lesson plans.
• Do not get too technical. In certain topics we will go over things in technical detail. This amount of detail will usually be too much for your students. Keep the intended audience in mind.
• The lessons do not have to include EVERYTHING from the unit. That would be impossible. The point if for you to sift through the material and choose a topic or two that you think would be accessible and interesting to your students.
• When you are finished with a lesson plan, scan the lesson and then upload it by navigating to the appropriate unit using the navigation menu in Blackboard and clicking the “Assignments” folder, then clicking the “Lesson Plan” link. All lesson plans should be submitted through Blackboard. Do NOT email me lesson plan submissions.

Grading

Your grade in this class will be awarded as a percentage out of 525 possible points based on the following grading rubric:

• Problem Sets: 350 possible points (50 per assignment)
• Lesson Plans: 175 possible points (25 per assignment)

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

Email

This is an online class. It is expected that you will check your ASU email regularly for announcements or other information relating to our class. All email associated with this class will be sent to your angelo.edu email address, unless otherwise arranged with me.

Notes

• 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 email 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 6327 – Graph Theory for Educators

Student Learning Outcomes

1. The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will learn the vocabulary, symbolism, and basic definitions used in graph theory.

2. The students will be able to describe the fundamental principles related to the concepts covered in this course. Students will become familiar with algorithms and theorems related to graphs. For example, students will learn and study Kruskal’s Algorithm, Kuratowksi’s Theorem, the Four-Color Theorem, and, more generally, Robertson and Seymour’s Graph Minors Project.

3. The students will apply course material along with techniques and procedures covered in this course to prove theorems and solve problems. Students will apply properties and theorems covered in this course to explore and determine various properties related to graphs. Students will demonstrate familiarity with the concepts and techniques through written assignments.

4. The students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields. Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study of graph theory or fields requiring knowledge of graph theory. These areas might include computer science or electrical engineering, as well as mathematics.

Course Content

Textbook: A First Course in Graph Theory, by Gary Chartrand and Ping Zhang.

Selected content from Chapter 1-10, as well as additional topics as time permits, will be studied. These additional topics might include, but are not limited to, graph minors, games on graphs, graph pebbling, and flows on graphs.
## Anticipated Schedule

Below is a table containing the due dates for our class.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>Unit 1 Problem Set</td>
<td>Monday, June 14, 2021</td>
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<tr>
<td>Unit 1 Lesson Plan</td>
<td>Monday, June 14, 2021</td>
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<tr>
<td>Unit 2 Problem Set</td>
<td>Wednesday, June 23, 2021</td>
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<tr>
<td>Unit 2 Lesson Plan</td>
<td>Wednesday, June 23, 2021</td>
</tr>
<tr>
<td>Unit 3 Problem Set</td>
<td>Friday, July 2, 2021</td>
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<tr>
<td>Unit 3 Lesson Plan</td>
<td>Friday, July 2, 2021</td>
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<tr>
<td>Unit 4 Problem Set</td>
<td>Monday, July 12, 2021</td>
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<tr>
<td>Unit 4 Lesson Plan</td>
<td>Monday, July 12, 2021</td>
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<tr>
<td>Unit 5 Problem Set</td>
<td>Wednesday, July 21, 2021</td>
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<tr>
<td>Unit 5 Lesson Plan</td>
<td>Wednesday, July 21, 2021</td>
</tr>
<tr>
<td>Unit 6 Problem Set</td>
<td>Friday, July 30, 2021</td>
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<tr>
<td>Unit 6 Lesson Plan</td>
<td>Friday, July 30, 2021</td>
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<tr>
<td>Unit 7 Problem Set</td>
<td>Monday, August 9, 2021</td>
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<tr>
<td>Unit 7 Lesson Plan</td>
<td>Monday, August 9, 2021</td>
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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
- Angelo State University Catalog

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.

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. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

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 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 for more information.

Title IX at Angelo State University

The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Miller, J.D.
Special Assistant to the President and Title IX Coordinator
Mayer Administration Building, Room 210
325-486-6357
michelle.boone@angelo.edu

You may also file a report online 24/7.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information, visit the Title IX website of Student Conduct.

Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification.

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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 http://www.angelo.edu/incident-form
viii https://www.angelo.edu/title-ix