

# MATH 4510/5510 COURSE SYLLABUS

Spring 2023

No Textbook for this Course

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**OFFICE HOURS:** Monday – Thursday 1:00 – 3:00 PM

I can have Zoom sessions upon request during these times. With some advance notice, I can be available for private Zoom sessions at other times, including times during the evening before 9:00 PM.

This is an inquiry-based learning class meaning that you will be active participants in the course. Course content will be developed through in-class investigation worksheets; all worksheets will be provided in your class D2L. Together we will complete a version of each worksheet, and the completed version will be posted in your class D2L once the homework assignment has been turned in. Lecture will be kept to a minimum.

Some of us may have to quarantine this semester. If I need to quarantine, then the class will go fully remote. I will update the syllabus if this happens. If you need to quarantine, it is critical that you keep in touch with me. You will be required to attend class via Zoom.

**Prerequisites:** This is an advanced, theory-based course. Math 3460 is a required prerequisite; Math 2010 is strongly recommended but not required.

**Purpose:** This course is intended to provide advanced undergraduates with additional experience in proof techniques while also giving them extensive exposure to groups. Topics covered include basic properties of groups, subgroups, group homomorphisms, quotient groups, and direct products.

**OBJECTIVES:** Upon completion of this course, students will have developed an understanding of:

1. operations and equivalence relations,
2. basic properties of groups,
3. special classes of groups,
4. homomorphisms and isomorphisms,
5. normal subgroups,
6. quotient groups.

**REQUIREMENTS:** In general, you are expected to

1. attend class lectures and work with your assigned small group,
2. read and study class assignments and solve assigned problems,
3. ask questions in class when unsure of any concept or unclear on any assigned problem;
4. take all announced exams (including the final) on the day they are scheduled
5. present assigned homework problems regularly in class.

**Grading:** This is an inquiry-oriented class that uses the "constructivist" approach to learning. Among other things, this means many class meetings will involve you working in small groups to help you understand the fundamental concepts of group theory. It is your responsibility as a member of this learning team to be actively participating, rather than merely taking notes.

The course will consist of at least twelve investigations. Each investigation presents you with a set of in-class problems that you will work on in small groups. I will frequently ask you to explain your thinking on parts of a problem or to present a completed problem along with your group. Your efforts in this regard will be taken into consideration when assessing borderline grades at the end of the semester.

Investigations can be found in your D2L course shell under "content".

Each investigation includes a set of homework problems. You are required to submit your solutions to these problems by the assigned deadlines. Typically, one homework assignment will be due each week. Late assignments will not be accepted unless you have contacted me in advance to make arrangements for turning in the assignment late.

**NOTE:** You may submit your homework in handwritten form, but it is preferable for you to type up your solutions in Word or LaTeX. I provide Word versions of the investigations so that you can type your solutions directly into the homework assignments.

**A word of caution:** Never draw upon ideas or concepts from outside of class if you cannot explain them. If you use notation or concepts that have not been developed in class, then I and everyone else in the class reserve the right to question you about their meaning. Your ability to explain these outside ideas and connect them to class content will be part of your participation grade or homework grade.

- Thirty percent of your grade will come from your submitted homework.

There will be regular definitions and concept quizzes. Most of these will be announced a class day in advance, and there will be roughly one per week starting in the second week. All quizzes will be about twenty minutes long and cannot be made up unless you have made prior arrangements with me.

- Ten percent of your grade will come from these quizzes.

There will be two closed-book in-class exams, each lasting a full class period. The first exam will be given near midterm and will cover the material in Investigations 0 - 6. The second exam will be given at the end of the semester and will cover the material in Investigations 7 - 11. Graduate students will also have a take-home portion of each exam that focuses exclusively on proofs.

Exam will be face-to-face unless the class is forced to go remote.

Graduate students will also be expected to write a short paper (five to ten typed pages) that addresses some group theory topic or application. This paper must include the statement and detailed proof of at least one result not discussed in class. The paper will serve as a third exam grade.

- Sixty percent of your grade will come from these exams.

A standard grading scale will be used on all graded work: 90-100 --- A, 80 - 89.5 --- B, etc. Particular grades are not curved; there will be an end-of-semester curve based upon class performance for homework, quizzes, and exams. (The curve is separate for graduate and undergraduate students.) Your grade will be computed using the following formula.

$$\text{Final Grade} = 0.60 \left( \frac{\text{Your Total Exam Score}}{\text{Highest Total}} \right) + 0.30 \left( \frac{\text{Your Total HW Score}}{\text{Highest Total}} \right) + 0.10 \left( \frac{\text{Your Total Quiz Score}}{\text{Highest Total}} \right)$$

You can monitor your grade at any time with this formula; simply use the maximum current total for each category in place of the highest total.

**ATTENDANCE:** Attendance is expected and vital for this class. Absences are not excuses for missing a graded in-class activity or turning in an assignment late. Late assignments will not be accepted and makeup exams will not be given unless you have made prior arrangements with me. With the exception of dire family emergency, you must contact me no later than the due day to get approval for late work.

- Except for medical or family emergencies, the scheduled makeup time cannot be more than two weekdays after the due date.

I usually return an exam or quiz no more than two class days after it is given. It is your responsibility to monitor your progress in the course. I strongly recommend you actively ask questions in class or come to my office regularly to discuss your progress. I will be happy to suggest strategies for helping you succeed, but no strategy provides a quick-fix. *Do not wait until the last few weeks of class to try improving your grade.*

**THERE ARE NO OPPORTUNITIES FOR EXTRA CREDIT IN THIS COURSE.**

This syllabus is only a guide for your convenience; I reserve the right to make changes as class needs dictate.

**Important dates:**

Jan 30 --- Last day to drop without a grade

March 26 --- Last day to drop with a "W"

March 6 – 11 --- Spring Break (No Classes)

April 27 --- Study Day (No Classes)

April 28 – May 4 --- Finals Week

**EXAM 2 WILL BE GIVEN ON THURSDAY MAY 4 --- 10:00 AM - 12:00 PM**

**IMPORTANT:** It is Department policy not to grant withdrawals after the withdrawal deadline has passed, unless circumstances have arisen which make it impossible for you to complete the course. Late withdrawals must be approved by the Department Chair and often require documentation for the extenuating circumstances.

**MTSU COVID-19 Policy**

**Attendance:** Students should not attend an on-ground, in-person class if they are ill, have any symptoms listed in the PreClass COVID-19 Self-Assessment, have tested positive for COVID-19, or have been in close contact with others who have tested positive. If they have tested positive or have been in close contact with someone who has, they should consider self-quarantine (see guidelines below). Students are expected to keep their instructors informed regarding their status when they are absent from class and act with good faith and honesty when determining whether or not they attend class. For more information, visit [MTSU Policies](#).

**Isolation/Quarantine:** MTSU has updated its isolation protocols as recommended by state and federal public health officials. The isolation requirement has been decreased to five days if symptoms are resolving, so that on Day 6 students and employees can resume activities (with masking through Day 10). Also, fully vaccinated individuals (boosted or within six months of last mRNA vaccine or within last two months of J&J) do not need to quarantine. And, those who are unvaccinated or not meeting full vaccination criteria need to quarantine five days, test on Day 5, and if negative, can resume activity wearing a mask through Day 10.

**Masking:** All students, faculty, and staff are strongly encouraged to mask and observe appropriate six-foot minimum social distancing while on campus. Masks are defined as disposable single-use paper masks, cloth face coverings with ear loops or ties, balaclavas, gaiters, and bandanas that cover the nose and mouth.

**Zoom behavior:** [University Policy 540 Student Conduct](#) stipulates that appropriate behavior is required both in person and online. Appropriate language and attire are required on Zoom, both in lecture and break-out rooms. For additional guidance on MTSU rules, facilities, and schedules, visit [MTSU Coronavirus Response](#).

## UNIVERSITY POLICIES

**DROP AND WITHDRAWAL POLICY:** Please note the Drop Policy and Withdrawal Procedures as they are stated in the Current Registration Guide. A grade of "I" will be given only in accordance with University Policy. No grade of "W" will be assigned after the official drop date except in situations involving extreme extenuating circumstances beyond the student's control. In particular, a "W" will not be granted merely because the student is failing. Students should be aware that missing the official drop date and thereby receiving an "F" can have ramifications on financial aid.

**Reasonable Accommodations for Students with Disabilities:** Middle Tennessee State University is committed to campus access in accordance with Title II of the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act of 1973. Any student interested in reasonable accommodations can consult the Disability & Access Center (DAC) website [www.mtsu.edu/dac](http://www.mtsu.edu/dac) and/or contact the DAC for assistance at 615-898-2783 or [dacemail@mtsu.edu](mailto:dacemail@mtsu.edu).

**Title IX (Harrasment):** If you believe you have been harrassed, disciminated against, or have been the victim of sexual assault, dating or domestic violence, or stalking, please contact a Title IX Deputy Coordinator at 615-898-2185 or 615-898-2750 or visit <http://www.mtsu.edu/titleix/> for resources. As a faculty member, I am legally obligated to share reports of such incidents with the MTSU Title IX coordinator.

**LOTTERY STATEMENT:** To retain the Tennessee Education Lottery Scholarship eligibility, you must earn a cumulative TELS GPA of 2.75 after 24 and 48 attempted hours and a cumulative TELS GPA of 3.0 thereafter. A grade of C, D, F, FA, or I in this class may negatively impact TELS eligibility. If you drop this class, withdraw, or if you stop attending this class you may lose eligibility for your lottery scholarship, and you will not be able to regain eligibility at a later time. For additional Lottery rules, please refer to your Lottery Statement of Understanding form (<http://www.mtsu.edu/financial-aid/forms/LOTFEV.pdf>) or contact your MT One Stop Enrollment Coordinator (<http://www.mtsu.edu/one-stop/counselor.php>).

**ACADEMIC MISCONDUCT:** Middle Tennessee State University takes a strong stance against academic misconduct. Academic Misconduct includes, but is not limited to, plagiarism, cheating, and fabrication. Plagiarism, cheating, fabrication, or facilitating any such act. For purposes of this section, the following definitions apply:

1. **Plagiarism:** The adoption or reproduction of ideas, words, statements, images, or works of another person as one's own without proper attribution. This includes self-plagiarism, which occurs when an author submits material or research from a previous academic exercise to satisfy the requirements of another exercise and uses it without proper citation of its reuse.
2. **Cheating:** Using or attempting to use unauthorized materials, information, or study aids in any academic exercise. This includes unapproved collaboration, which occurs when a student works with others on an academic exercise without the express permission of the professor. The term academic exercise includes all forms of work submitted for credit or hours.
3. **Fabrication:** Unauthorized falsification or invention of any information or citation in an academic exercise.

Going online and taking information without proper citations, copying parts of other student's work, creating information for the purposes of making your paper seem more official, or anything involving taking someone else's thoughts or ideas without proper attribution is **academic misconduct**. If you work together on an assignment when it is not allowed, it is **academic misconduct**. If you have a question about an assignment, please come see me to clarify. Any cases of academic misconduct will be reported to the Office of Academic Affairs for violating the academic honesty requirements in the student handbook. They will also result in failure for the course. Remember – ignorance is NOT a defense.

**Classroom Misconduct:** The instructor has the primary responsibility for maintenance of academic integrity and controlling classroom behavior, and can order the temporary removal or exclusion from the classroom of any student engaged in disruptive conduct or conduct that violates the general policies of the Institution for each class session during which the conduct occurs. Extended or permanent exclusion from the classroom, beyond the session in which the conduct occurred, or further disciplinary action can be effected only through appropriate procedures of the Institution. If an instructor wishes to remove a student from the classroom for a longer period of time or permanently, he/she must refer the student to the Office of Judicial Affairs and Mediation Services.

Disruptive behavior in the classroom may be defined as, but not limited to, behavior that obstructs or disrupts the learning environment (e.g., offensive language, harassment of students and professors, repeated outbursts from a student which disrupts the flow of instruction or prevents concentration on the subject taught, failure to cooperate in maintaining classroom decorum, etc.), text messaging, and the continued use of any electronic or other noise or light emitting device which disturbs others (e.g., disturbing noises from beepers, cell phones, palm pilots, lap-top computers, games, etc.).

Please note that the rules of proper conduct still apply to Zoom sessions. The norms that apply in face-to-face conversations also apply to Zoom sessions. Use acceptable viewing angles and do not have offensive material in your background --- failure to do so could leave you open to harassment complaints and possible legal action.