

MATH 523
GEOMETRIC AND ALGEBRAIC STRUCTURES
Nicholls State University, Fall 2008

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My office hours are 9:00 am – 12:00 pm M, W, F, 4:00 – 5:00 pm W, and 4:00 – 6:00 pm TH. Please contact me (phone, email, or in person) during these times if you have any questions. If you need assistance at a different time, let me know and we'll work something out.

Prerequisite/Corequisite: Math 509

Text: None. We will use notes that I will upload to Blackboard approximately every week.

Course Description (catalog): Examination of the complementary relationships between geometry and algebra, and among the structures in each discipline. Focuses on the interdependence among geometric and algebraic properties of objects. Spatial reasoning, non-Euclidean representations of curves and space, fractal geometry, calculus of higher dimensions. Representation of geometric structures and other phenomena via semigroups, groups, rings, and other algebraic constructs.

Course Description (instructor): This course could be easily a geometrical approach to algebra or an algebraic approach to geometry. We'll do the former. I will not assume students know any modern algebra.

In particular, at the end of the semester, a student will be able to:

- define many types of groups, including (but not limited to) finite group, infinite group, cyclic group, dihedral group, symmetry group, permutation group, and abelian group
- perform computations using permutations
- give examples of various kinds of groups
- perform transformations using isometries, homomorphisms, isomorphisms and group actions
- state and prove various theorems, including (but not limited to) Cayley's Theorem, Cauchy's Theorem, Lagrange's Theorem, Sylow's Theorems, and Burnside's Lemma.

A few words need to be said about the Internet aspect of this course. All assignments, notes, and announcements will be posted on Blackboard. All students enrolled in an Internet course should have basic computer skills (such word processing, e-mail, navigating the Internet, etc). Some tips on preparing yourself for an online course are available at www.nicholls.edu/distance. As an online student, you will be somewhat self-paced. This therefore requires self-discipline and self-motivation. The problem sets need to be turned in on time. It is the responsibility of the student to notify the instructor of technical and/or personal problems that may interfere with online participation. All students must check their e-mail account regularly. E-mail will be our primary means of communication. If you need more personalized assistance, I invite you to contact me (either in person or on the phone) during office hours. Just like a typical class, instances of academic dishonesty, such as plagiarism, will not be tolerated.

Grading Policy: We will have two exams (a mid-term and a final) and several problem sets throughout the semester. Both exams will be comprehensive and neither is optional. One or both of the exams *might* be take-home. If any exam is NOT take-home, students will have two options: (1) come to campus at the designated time and take the exam “in-class” with me as the proctor, or (2) make arrangements in advance of the test date at a local academic institution to administer the test to you, in which case you will need to complete the “Distance Learning Test Administration Procedure and Approval Form” (see last page of this syllabus) and return it to me prior to your exam.

Each component (problem sets and exams) will count for 50% of your course grade. At the conclusion of the semester, I will assign letter grades based on the usual 10% grading scale (A: 90-100%, B: 80-89%, C: 70-79%, etc). I will not accept late problem sets unless there are VERY unusual circumstances, and make-up exams will only be administered if the student provides a valid excuse. The instructor decides which excuses are valid. Academic dishonesty (i.e. cheating, plagiarism, etc.) will not be tolerated. Sanctions for such behavior are outlined in the *Code of Student Conduct* (Section 1.9).

Important Dates: Our mid-term exam will most likely take place (or be due if it is a take-home exam) October 6-8, 2008. The “drop day” is Friday, October 24, 2008. Our final exam will take place (or be due if it is a take-home exam) December 1-3, 2008.

Academic Grievances: The proper procedure for filing grade appeals or grievances related to academic matters is listed in Section 5 of the *Code of Student Conduct* and at the following link: http://www.nicholls.edu/documents/student_life/code_of_conduct.pdf.

Continued Learning following an Extreme Emergency: In order to make continued learning possible following an extreme emergency,

students are responsible for:

- reading regular emergency notifications on the NSU website;
- knowing how to use and access Blackboard (or university designated electronic delivery system);
- being familiar with emergency guidelines;
- evacuating textbooks and other course materials;
- knowing their Blackboard (or designated system) student login and password;
- contacting faculty regarding their intentions for completing the course.

faculty are responsible for:

- their development in the use of the Blackboard (or designated) software;
- having a plan for continuing their courses using only Blackboard and email;
- continuing their course in whatever way suits the completion of the course best, and being creative in the continuation of these courses;
- making adjustments or compensations to a student's progress in special programs with labs, clinical sequences or the like only in the immediate semester following the emergency.

Disability: If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of your academic accommodations. The Office of Disability Services is located in Peltier Hall, Room 100-A. The phone number is (985) 448-4430 (TDD 449-7002).

Division of Mathematics / Nicholls State University
Distance Learning Test Administration
Procedure and Approval Form

Please return the completed form to the instructor.

Students taking examinations via distance learning are required to make arrangements with an authorized testing institution. These accommodations are to be communicated to the instructor of the distance learning course.

Please note the following.

- 1. The testing center / test administrator shall have computer / e-mail access for the student during the examination period in the event of online communication by the instructor.**
- 2. The testing center shall have telephone* access for the student during the examination period in the event of oral communication by the instructor. Some instructors wish to speak with the student and the test administrator at the commencement of the testing period.**
- 3. At the end of the testing period, the test shall be signed by both the student and the test administrator.**
- 4. The student shall present photo identification before gaining access to the examination.**
- 5. At the discretion of the administrator, unusual disruptions of the testing period shall be documented and communicated to the instructor.**

Name of Student: _____ Course: _____

Instructor: _____

E-mail of Instructor: _____

Date of Exam: _____ Time of Exam: _____ Eastern Central
Mountain Pacific

Institution Administering Test: _____

Institution Website: _____

Test Administrator: _____

Department: _____

Position/Title: _____ (This will be verified by the NSU Math Dept.)

E-mail Address: _____ (Must be available during exam)

Administrator's Phone: _____

*Exam Phone (if diff from above): _____ (Must be available during exam)