

MATH 523

GEOMETRIC AND ALGEBRAIC STRUCTURES

Section WWP
Nicholls State University, Spring 2017

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My office hours are:

Mon/Wed	1:00-3:00 pm
Tue/Thu	1:00-4:00 pm

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 class notes.

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. It will essentially be an advanced modern algebra class, but I will not assume students know any modern algebra. We'll start with the basics and move quickly to more advanced and interesting topics.

Our course outline is as follows (we will cover as much of this as possible, time allowing):

- Introduction
- Chapter I Fundamentals
- Chapter II Groups
- Chapter III Rings
- Chapter IV Fields
- Chapter V Group Actions

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, announcements, etc. will be posted on Moodle. All students enrolled in an Internet course should have basic computer skills (such as word processing, e-mail, navigating the Internet, etc.). I invite you to visit the distance education webpage (<http://www.nicholls.edu/distance>) for more information and guidance. 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. Since email will be our primary means of communication, you will need to check your Nicholls email account regularly (*at least* once a day) for possible news and/or announcements. Additionally, please feel free to email me as often as is necessary if you have questions about the material. Finally, just like a typical class, instances of academic dishonesty such as plagiarism will not be tolerated. Sanctions for such behavior are outlined in the *Code of Student Conduct* (Section 1.9).

Special Note: Section Five of the Code of Student Conduct, 'Academic Dishonesty and Disruptive Behavior,' includes a requirement that faculty file a charge complaint statement with their respective dean whenever a student is confronted or disciplined for cheating. The Office of Academic Affairs will maintain these records, and any student confronted and/or disciplined for multiple offenses of academic dishonesty will be brought before the Academic Affairs Integrity Committee for further review and potential sanctions. Please read the Code of Student Conduct for further details regarding this policy."

Grading Policy: We will have two exams and many weekly assignments. These will be described fully below.

Exams: We will have an "in-class" midterm exam and a "take-home" final. The "in-class" midterm exam will obviously not actually be in-class, since we do not have class. It will be a typical proctored, timed exam that students will take at a specified time and place (as opposed to a "take-home" exam that you can complete when and where you want during the time you are working on it). Once the day of the midterm exam gets closer, I will schedule a time for the local students to take their exam with me. ***Distance education students need to choose an approved testing center in their local area and complete a Proctor Approval Form to taking the exam. Once the form has been uploaded to Moodle, I will give you two weeks to inform me of your choice. That will allow me ample*

*time to contact your designated proctor and approve (or not) the selection. **
Each exam will count for 25% of your semester grade.*

Problem Sets: You will have regular problem sets assigned approximately once a week. Problem sets will consist of typical mathematics exercises, discussion boards to participate in, and/or independent research, etc. ***This portion will account for 50% of your semester grade.***

At the conclusion of the semester, letter grades will be assigned based on the usual 10% grading scale (A: 90-100%, B: 80-89%, C: 70-79%, etc). Late assignments will not be accepted 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 and which circumstances are unusual. As I said above, academic dishonesty (i.e. cheating, plagiarism, etc.) will not be tolerated.

Important Dates

‘W’ Day – Friday, March 24, 2017

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:

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 Moodle (or university designated electronic delivery system);
- being familiar with emergency guidelines;
- evacuating textbooks and other course materials;
- knowing their Moodle (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 Moodle (or designated) software;
- having a plan for continuing their courses using only Moodle 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.

Assistance with Studying and Assignments:

- The Tutoring Center at 143 Peltier Hall. Call 985-448-4100, email tutoring@nicholls.edu, or visit <http://www.nicholls.edu/academic-enhancement>.
- The Writing Center at 144 Peltier Hall. Call 985-448-4100, email tutoring@nicholls.edu, or visit <http://www.nicholls.edu/academic-enhancement>.
- Online Tutoring through Moodle. Look for the Brainfuse log-in link on the home page, <http://moodle2.nicholls.edu/moodle>

ADA Compliance: 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 158A Shaver Gym. The phone number is (985) 448-4430 (TDD 449-7002).