

UAB Department of Mathematics

# SYLLABUS

Spring 2013

MA 435-2C – Algebra II-Modern

(also MA 535-2C)

|              |                  |                    |  |        |          |
|--------------|------------------|--------------------|--|--------|----------|
| Instructors: | Dr. John Mayer   | Instructor e-mail: | <a href="mailto:jcmayer@uab.edu">jcmayer@uab.edu</a> | phone: | 934-2154 |
|              | Dr. Paul Jung    | Instructor e-mail: | <a href="mailto:pjung@uab.edu">pjung@uab.edu</a>     | phone: | 934-2154 |
| Assistant:   | Mr. David Cosper | Assistant e-mail:  | <a href="mailto:dcosper@uab.edu">dcosper@uab.edu</a> | phone: | 934-2154 |

Office hours: TBA

**Class meeting Time/Location:** Tuesday/Thursday, 11:00 AM – 12:15 PM, HHB 221

**Course Structure:** This course is a “guided inquiry” course. That is, your textbook will consist of statements of definitions, axioms, problems, and theorems, and occasional brief explanations. There will be very little lecture. You will be expected to solve the problems and prove the theorems yourself individually, and in small groups. Daily small group assignment is at the instructor’s discretion and may be random, student-determined, or instructor-determined. Individual and group work will be “processed” by the class as a whole. Processing involves a whole class discussion of the problem or theorem, usually based upon one or more student presentations to the class. You will keep a complete record of your achievements, as well as notes taken in class, in your permanent class notebook.

Competence in oral and written communication of mathematics is a major goal of the course.

In a guided inquiry course, when you are working, individually or in a group, you are expected NOT to consult outside sources such as other algebra textbooks, internet websites, smarter friends, or the like. You may work with other students in the class, but if you present the work, you must give credit to all who contributed to it. (For example, you would say “Ann and I worked together on this.”) This will not diminish your credit, but is required by academic honesty. Moreover, your collaborators are not required to bail you out of difficulty, but may elect to do so.

**Materials:** There is a textbook for this course: David Clark, *Theory of Groups*. The textbook will be available on Blackboard or by email from the instructors. You will need to bring to class every day the following items.

1. A 3-ring binder containing
  - a. your printed textbook, complete,
  - b. your class notebook, including work in progress and finished work, with all entries up-to-date, and
  - c. your graded quizzes.
2. Sharp pencils or pens.

**Attendance policy:** Attendance at every class meeting is required. Roll will be taken by signing in. ACTIVE participation counts 20% of your final grade. The following rules apply:

1. Students may not sign the roll for other students. To do so is academic dishonesty.
2. If you come late to the class meeting, do not ask to sign the roll; do not sign the roll if you intend to leave the class early.
3. In case of emergency, students may leave the class without the instructor’s permission. Just get the instructor’s attention and leave quietly with minimal disruption to the rest of the class.

4. If you will be absent on official university business or scheduled medical appointments, arrangements must be made in advance of the absence.

**Cell Phones.** Student cell phones must be **on vibrate or off** during all class meetings.

**Course Grades:** Students earn their grade in the course as determined in the tables below. How each grade component is determined is described in the paragraphs that follow. Recall that a grade of **D** cannot count toward the mathematics major.

| Grade Element | Points | Percentage Points Earned   | Course Grade |
|---------------|--------|----------------------------|--------------|
| Quizzes       | 120    | 88% or more                | A            |
| Participation | 60     | At least 75% but below 88% | B            |
| Notebook      | 60     | At least 62% but below 75% | C            |
| Final Exam    | 60     | At least 50% but below 62% | D            |
| Total         | 300    | Below 50%                  | F            |

**Notebook:** Both work done in class, in small groups and individually, and any notes you take based upon whole group discussion or lecture, will be kept in your permanent class Notebook (loose leaf 3-ring binder). Nothing should be erased – just mark it through ~~thru~~ (you should still be able to read what you strikethrough). Your Notebook will be collected periodically and the extent to which you are keeping up with the work required will be evaluated for the Notebook portion of your grade. Your Notebook should contain the following sections:

- Textbook
- Class Discussion Notes
- Work in Progress
- Finished Work
- Quizzes

Expect your Notebook to be evaluated about every other week (6 times total), 10 points maximum each time. You will be amazed at how your work will improve over the semester!

**Participation.** You are expected to participate actively, particularly in small group work and class processing discussions. Normally you will earn 2 points per class meeting (about 30 meetings total), for 20% of your final grade. The instructor will warn you privately if your participation is below the acceptable range. (It is tempting NOT to do the individual homework. Do not fall for it!) Mere presence does not constitute participation.

**Pre- and Post-Test.** There will be a Pre-Test and a Post-Test which will count as up to 15 points bonus credit toward the 300 points upon which your final grade is based. You must take both Pre-Test and Post-Test to earn maximum credit.

**Quizzes.** Quizzes will be given in class without prior announcement, and based primarily upon work done within the current and one or two prior class meetings. Quizzes will be of a similar nature to the types of problems, examples, and theorems encountered in class and in working through the textbook. You should expect a quiz nearly every week (12 during the semester). Each quiz counts 10 points unless otherwise specified at the time. Quizzes count 40% of your final grade. (There are no tests that take a full class period.)

**Final Exam.** The final exam will consist of a number of problems similar to the major problems and theorems of the course, but not repeating problems in the course. You will be able to select a small number of problems to work on from a longer list for the IN-CLASS final exam. The final exam counts 20% of your final grade.

**Rubrics.** Problems on the Pre/Post-Test, Quizzes, and Final Exam problems will be graded according to the Quiz-Scoring Rubric. Notebooks will be graded according to the Notebook Rubric. Rubrics are on page 4 of this syllabus.

**Make-up policy:** There are no make-up quizzes or make-ups for absence resulting in decreased participation credit. If you miss a class for a verifiable emergency, necessary medical appointment, or on UAB official business, the instructor will work with you to find an accommodation. Since participation, particularly in small group work and class processing discussion, is a very important part of the course, repeated unexcused absences (or late arrivals) beyond 20% of the class meetings cannot be tolerated for any reason, and will result in a grade of **F** for the course.

**Disability Support Services (DSS).** DSS offers tutoring and special accommodations to students who qualify. The UAB DSS office is located on the fifth floor of the Hill University Center, telephone: 934-4205, e-mail: [dss@uab.edu](mailto:dss@uab.edu). Students who have DSS-approved accommodations should see the instructor privately for further information.

**Withdrawal:** You are expected to be aware of official UAB withdrawal policies.

**Student Conduct Codes.** You are expected to be aware of, and rigorously adhere to, the UAB codes of conduct with regard to academic honesty and inter-personal relations.

**MA 535 Students Only.** MA 535 is scheduled with MA 435 and MA 535 students participate in all class activities described above without distinction being made between MA 435 students and MA 535 students. However, MA 535 students have an additional requirement: a 5-10 page mathematical expository paper on some aspect of advanced (beyond course topics) group theory or other topic in abstract algebra. Discuss your topic selection with the instructor well in advance. This is the one case where you can consult other sources. Toward the end of the semester, there will be an EXTRA class meeting at which this paper will be presented to the other graduate students in the class as an expository talk. The instructor will evaluate both the written paper and the oral exposition according to a rubric that you will receive in advance of writing the paper. The paper and presentation count an additional 60 points together toward your grade, for a total of 360 points (to which the Percentage grade table above is applied). Students in graduate courses cannot receive a grade of **D** in the course, so any grade below 62% is an **F**.

### **Groups of 4 Rules**

- 1.** Each member takes responsibility for his/her own learning.
- 2.** Each member of the group is willing to help every other group member who asks for help.
- 3.** Groups may ask the teacher for help only when all group members have the same question.
- 4.** There is always a further challenge.

## UAB – Algebra II-Modern, Quiz-Scoring Rubric

|          | <b>Conceptual Understanding:</b><br><i>Interpreting the concepts of the task and translating them into mathematics</i><br><i>(Identifying the “core” of the problem)</i> | <b>Evidence Of Problem Solving:</b><br><i>The use of task-appropriate tools and problem solving strategies.</i>       | <b>Explanation:</b><br><i>Using verbal reasoning and appropriate constructions to best convey the solution.</i><br><br><i>(The explanation flows smoothly.)</i> | <b>Accuracy:</b><br><i>Providing a wholly justified solution for the task at hand.</i> |
|----------|--|---|---|--|
| <b>3</b> |  |   | Explanation is coherent, and the ideas involved follow logically from previously stated ones.   | The solution is completely justified, with no gaps in the argument.                    |
| <b>2</b> | Student’s work has demonstrated that he/she has fully identified the major concepts of the task.   | The student’s work has demonstrated the strategic use of all task-appropriate tools and problem solving methods.      | Explanation is not sufficiently rigorous or something may not immediately follow from what is written.  | The solution has one or two minor gaps in justification.                               |
| <b>1</b> | Some, but not all, of the major concepts needed were evident.  | Not all tools needed for the task are used or the tools are not used in a manner appropriate for solving the problem. | Explanation has many gaps or many steps need to be inferred.  | The solution has major gaps in the justification.                                      |
| <b>0</b> | Does not achieve minimal requirements for 1 point  | Does not achieve minimal requirements for 1 point   | Does not achieve minimal requirements for 1 point   | Does not achieve minimal requirements for 1 point                                      |

Note that it is possible to be lacking in one or more categories (for example, explanation), but receive credit in all other categories.

## UAB – Algebra II-Modern, Notebook Rubric

| Points   | Item             | Description  |
|----------|------------------|--|
| <b>6</b> | Completeness     | 0-6 points will be earned each time your Notebook is graded based upon the extent to which all problems, theorems, etc. (up to the point where processing has not yet passed the problem number) is complete and correct. This is based mainly upon the “Finished Work” part of your Notebook. Points can be lost for lack of organization of your Notebook, incomplete copy of Textbook, and other omissions and flaws in Notebook maintenance. |
| <b>2</b> | Specific Problem | 0-2 points will be earned each time your Notebook is graded based upon one problem (previously processed in class) which will be graded carefully for accuracy and quality of explanation.   |
| <b>2</b> | Homework         | 0-2 points will be earned each time your Notebook is graded based upon your current Homework effort, which will be evaluated for completeness.   |