

Syllabus
UTK – M351 – Algebra I
Spring 2007, Jochen Denzler, MWF 10:10–11:00, Ayres 205

Course Description: Course Description: There are probably at least two virtually non-intersecting, equally legitimate courses M351: one primarily focused on groups, the other primarily focused on rings; mix and match is also possible. We will primarily focus on rings, with a miniature introduction to the definition of groups preceding. The reason is that themes of common mathematical experience and particular relevance for future teachers, namely modular arithmetic and polynomials, are key paradigms for rings.

Math 300 is a prerequisite for Math 351. What is primarily needed from Math 300 is the abstract reasoning and proofwriting, the notation and operations with sets, and the chapter on equivalence classes.

Math 251 (or 257) is also a prerequisite for this course. Primarily, matrix arithmetic and special kinds of matrices, because they'll serve as examples. And the 'culture' of 251, where the notion of abstract vector spaces and inner product spaces was introduced. These were probably the first abstractly introduced algebraic structures in your career, and groups and rings are defined in a similar, axiomatic, way.

Course Contents: Definition of a group, and examples. No theory. — Rings and examples. — Integers, congruences modulo an integer, and a bit of elementary number theory; some basic ring theory; polynomial rings.

Textbook: We adopt Joseph Landin: Introduction to Algebraic Structures as textbook. It is concisely written, without the modern layout gimmicks, and available well below 20 bucks as a Dover reprint. I will provide my own homework, and I will not follow the book slavishly section by section. We will primarily study the ring chapters of the book.

Philosophy: In case of doubt, I'll cover less material in more depth rather than a lot of material too superficially. I do not assign gazillions of cloned problems for training ad nauseam, but will require you to think about the homework problems. My teaching decisions are guided by the (fictitious) scenario that you have another final half a year after the course is finished, with my salary depending on how well you still remember the most important points of the course. Usually, I do NOT give an extensive review before in-class exams. This would encourage bulimic learning strategies. You must strive to assemble the material in your brain as a coherent and meaningful entity, not as a bag of of single facts. That's more rewarding and prepares you better, and you'll need to relearn less before the comprehensive final.

The lecture itself will constantly review things by connecting material into a coherent panorama. It will give you roadmaps for the hwk, but not guide you through it like a GPS.

Homework: You may find some hwk difficult and still end up with an A. That's a feature, not a bug. I am available for questions in the office and actually encourage office visits. The clearest indicator for imminent poor grades is if you try to poke around in the dark or write down things that you couldn't explain if I asked you 'why?' or 'what does it mean?' – Seen too many folks do it, which is why I am adamant and dogmatic on this issue.

I will grade some, but not all hwk. Each hwk that is graded will be graded with either 0, 1 or 2 points unless specified otherwise. Some hwk may be organized as ping-pong: you hand in an honest attempt, I return it with a hint or helpful question, you amend or improve or retry, with the final score being determined when you claim to have a definite solution. That means you may get help for free; if you confidently (or negligently) turn in gobbledeegook you get 0 right away, but if you display uncertainty and ask a question, you'll be better off.

You will occasionally present hwk at the blackboard. Here is how it works: As you enter the classroom, you list hwk problems you could not do and want to see done on the blackboard (no name needed). Before the class begins, you also submit on a file card or small paper those hwk

pbms you are prepared to present on the blackboard (with your name). I draw a presenter at random from the 'can present' group for those problems that were requested most. A successful presentation counts like 3 extra credit graded hwk problems, and the randomness of the drawing will be overruled by the principle that those who have not made a presentation yet will get a chance before those who have already, if available.

Office hours: Will be scheduled soon. I do accomodate drop-in whenever possible, and you may also schedule appointments. But I intend to reserve Tuesdays free of appointments and drop-in. I try hard to take as much time for you as is needed. But do come with specific questions or attempts (even failed attempts are fine) at a problem.

My office is **Ayres 317 E, phone 4-5325**. Email is **denzler@math.utk.edu**, but I may not read it for half a day or for an entire weekend. My website is **<http://www.math.utk.edu/~denzler>**. From there, you'll find a link to the course website, which you may want to bookmark. Any course material I may post will be public in principle; I will use the Blackboard system only for administrative purposes and mail to class.

Grade: We'll have two in-class exams and one final exam. The relative weight will be: 1/6 for each in-class exam, 2/6 each for hwk and final; or else 1/5 for each in-class exam and the hwk, and 2/5 for the final, whichever works out better for each individual.