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SYLLABUS

Abstract Algebra II, Fall, 2004

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Instructor: James A. Davis   Office hours: MWF 10:30-11:30; T 2-3

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I. <u>COURSE DESCRIPTION:</u> Abstract algebra 2 is a continuation of the concepts found in the first course in algebra. We will be studying objects called rings and fields, and we will be using all of the tools that we developed in the first course to study groups. The basic ideas will be the same: we will have a set (often some subset of numbers) together with some binary operations (in these cases 2 binary operations). We will want to know when 2 rings are "isomorphic", how we construct new rings from some familiar ones, what analogies do we have to factor groups, etc. We will also be discussing polynomials, including how we can know when a polynomial has roots (this is probably what most people think of when they hear the word algebra).

A key hint to success in understanding abstract algebra is to tie yourself to the examples. I will do my very best to illustrate every theorem with familiar examples, and you should try to do that as well. You should get to the point where the first question you ask yourself when you need to prove a theorem is "Do I believe it for the integers? the rationals? the reals? matrices? polynomials?" We will describe these examples in class, and if you can get them firmly implanted in your mind, you will find that to be a very helpful aid in proving general results about rings and fields.

II. <u>GRADING</u> The grading will be as follows:

in-class exams 15% apiece, tentatively scheduled for 10/8 and 11/22

final exam 30%, cumulative

weekly homework 30%. In order to get an A in the class you need to do at least 3 $\star$ problems with no assistance from anyone. These problems must be absolutely perfect to get full $\star$ credit (you can still get partial credit for the homework assignment).

in-class board problems 10%. We will start each class with 3 problems put on the board. You will be graded on your preparation and presentation of these results. I will NOT be impressed with trying to think through these problems on the fly. I will make a random choice of presenters, and you need to be prepared every day.

One opportunity to get some easy points is to attend some of the lectures given in the math department. In order to get the credit, you will need to attend the lecture and write a one paragraph summary of what you learned. I will announce the lectures to you as soon as I know when they are scheduled. You can use this for at most 4% of your final grade, but you need to attend at least 2 to get 4%.