

Math 676, Section 4, Computer Algebra, MWF 3:00, Room E 106

Room: Will change to E106 as of Jan 24. (The original room has only 12 seats for 13 students.)

Lecturer: Alexander Hulpke, Weber 217

Office Hours: See <http://www.math.colostate.edu/~hulpke/officetimes.html>

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WWW: <http://www.math.colostate.edu/~hulpke/lectures/m676ca>

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Textbook: Jürgen Gerhard, Joachim von zur Gathen: Modern Computer Algebra, Cambridge University Press, 1999.

Note: According to the publisher, the book is currently out of print with the next edition being published in March. The first chapters of the book we will use are available on the “Electronic Reserve” pages of the Library. You have to log in with your University ID (usually the Social security number) and name, you can then view or download PDF files of the book.

I will keep you informed about further development.

I am planning to cover material that corresponds roughly to chapters 2-6,14-17,21-24.

Two further books that cover much of computational algebra, often supplementing the textbook, are: K. Geddes, S. Czapor, G. Labahn: Algorithms for computer algebra (alas, obscenely expensive!). The library has an electronic-only version at QA155.7.E4 G43 1992eb. It requires a non-standard web-browser plugin (DjVU).

H. Cohen: A Course in computational Algebraic Number Theory, QA247.C55 1993b.

Grades/Exams

This being an advanced graduate course I'm planning to dispense with midterms and a final and to base grades on homework. (If you want to have the course considered a portfolio course for the PhD qualifier, please talk to me. Similarly, talk to me if you would prefer homework with a stronger programming component.)

For privacy reasons the university does not permit open posting of grade information. Because of this, overall grades will be posted in WebCT. (Log into WebCT and select the M676-4 course.)

Homework

Homework will be handed out every monday in the lecture, and is due at the start of the lecture of the wednesday of the following week. Late homework will be accepted only if the

delay is due to reasons beyond your control.

Due to time restrictions, only to some of the problems can be treated in class, but I'm happy to go through any problems during office hours.

Computer use

This course being about computer algebra, some homework will involve explicit calculations that are infeasible to do by hand. (However the course does not require programming, we will use the computer mainly to perform explicit example calculations.)

For this you are welcome to use whatever computer algebra system you are accustomed to (Maple, Mathematica or MuPAD – however MATLAB is unlikely to be sufficient since it only supports floating point numbers), in the lecture I will (for selfish reasons ...) use the free system GAP. This system is installed on the Mathematics computers. If you want to install it on your home PC (Linux/Windows/Mac) you can either download the program from <http://www.gap-system.org> or borrow a CD-ROM from me. (You won't be examined about the use of this program.)

In general, you can use a computer for any calculations in the homework, as long as the commands used do not render the problem trivial. (For example you may use polynomial arithmetic if the problem is to compute a gcd of polynomials, you may use a gcd routine if the problem is to factor polynomials.)

The first homework sheet contains an introduction to the basics of GAP.

I wish you success with this course and all the best for the coming semester.