MATH 530 SYLLABUS

Instructor: Shiang Tang

Email: shiang@illinois.edu

Course Description: Course Description: This course is an introduction to algebraic number theory. You will learn the basic concepts and fundamental objects in algebraic number theory. Topics include Number Fields and Number Rings, Arithmetic of Dedekind Domains, Minkowski Theory and Dirichlet Unit Theorem, Local Fields, Global Fields and Galois Theory, Kronecker-Weber Theorem. We will also discuss about additional topics if time permits.

Textbooks:

- Daniel Marcus: Number Fields, Second Edition (E-book available through the UIUC library).
- James Milne: Algebraic Number Theory (Free E-book available online).

Grading Components:

- Weekly Homework Assignments (30 percent)
- Zoom attendance on Fridays (10 percent)
- Midterm (30 percent)
- Final (30 percent)

Zoom office hours: TBA

Technologies needed for this course: Moodle, Campuswire and Zoom. Link to the course LMS: `https://learn.illinois.edu/course/view.php?id=55711`

Communication: To contact me, just send me an email. Everything about this course will be announced through Moodle Announcements, and the message will go to your Illinois mailbox. I will reply to emails within 24 hours (except on weekends and holidays). You are encouraged to attend my weekly office hours on Zoom.

How this course will be run:

- Weekly lectures. Two 50-minute synchronous lectures on Monday and Wednesday, 2:00-2:50 PM, CST, plus a 40-minute asynchronous lecture ready by the end of Wednesday. All lectures will be recorded with links to the videos. Lecture notes will also be posted.
- Interactive component. On Fridays, we will spend about 25 minutes to answer questions from the asynchronous lecture: priority will be given to questions posted on Campuswire beforehand, then I will answer other questions if time permits. Then we will spend another 25 minutes to run a breakout room discussion, in groups of three

or four, on the homework due by the end of the day. Attendance will be checked. The lowest three scores will be dropped.

- Homework submission. Each tab on Moodle (labeled by the week) contains a homework assignment consisting of three to five exercises. After clicking the assignment you will see a PDF file containing these exercises. View the PDF file, work on the exercises and discuss with your peers on Friday's meeting. When you are finished, scan or take a picture of your work and submit the file via the assignment link on Moodle.

- Exams. Closed book exams will be synchronously proctored on Zoom. There are links to the exams on Moodle. The way you view, complete and submit the exams is the same as that for the homework. Each exam lasts about two hours. More detailed instructions will be available a week before the exam.

Homework grading: To receive full credit for an assignment, you must provide clear explanation for each problem that demonstrates your solution process. Having only numbers and/or formulas for a solution is worth half of the credit. Spell out clearly the theorems/propositions/lemmas you use in your solution. Generally speaking, you will not lose credits for using a fact unless it trivializes the proof.

Exam grading:

- If you use a theorem/proposition/lemma you must indicate this and explain why it may be applied.

- Organize your work in a reasonably neat and coherent way. Work scattered all over the page without a clear ordering will receive very little credit.

- Mysterious or unsupported claims will not receive full credit. A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct explanations might still receive partial credit.

Policies on late homework, make up exams, etc.:

- No late homework will be accepted, regardless of the reason. However, the two lowest scores will be dropped.

- You are allowed to miss at most three discussion sessions on Fridays without penalties.

- If you need to take a conflict exam, you must inform me at least three days ahead; if you cannot take an exam in time for any reason, you must inform me as soon as possible. Failing to do so may result in a 0 on the exam you miss.

- No exam score will be dropped.

- There is no plan for a curve on the grades.

Letter grades: The following scale is *tentative* and the actual cut off lines may vary by at most 2 percent. 95-100: A plus; 85-95: A; 80-85: B plus; 70-80: B.

Cheating: Cheating, that is, an attempt to dishonestly gain an unfair advantage over other students, is taken very seriously. Penalties for cheating on exams may include a zero on the exam or an F in the course.

Disabilities: Students who require special accommodations should contact the instructor as soon as possible. Any accommodations on exams must be requested at least one week in advance and will require a letter from DRES. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu