

Math 721: Algebra II

Course Information Sheet and Syllabus

Spring 2015

Instructors:

Dr. Susan Cooper

Office: Minard Hall, Room 406G *Email:* susan.marie.cooper@ndsu.edu *Phone:* 701-231-8174

Office Hours: Mondays & Wednesdays & Fridays 10:00 a.m. – 10:50 a.m.; or by appointment

Correspondence: The most reliable way to contact me is via email.

Dr. Sean Sather-Wagstaff

Office: Minard Hall, Room 408E20 *Email:* Sean.Sather-Wagstaff@ndsu.edu *Phone:* 701-231-8105

Office Hours: Mondays & Wednesdays & Fridays 10:00 a.m. – 10:50 a.m.; or by appointment

Class Times and Location: MWF 11:00 a.m. – 11:50 a.m., South Engineering – Room 208

Prerequisites: Math 421/621, or permission of instructor

Credit Hours: 3

Course Web-Page: We will use *Blackboard* which can be found at <https://bb.ndsu.nodak.edu/>.

Textbook: Course notes will be available on the course web-page. We may update the notes during the semester. You may also consider purchasing:

“Abstract Algebra” by Dummit and Foote , or “Algebra” by Hungerford.

Course Description and Objectives: The basic idea of abstract algebra is to study a set endowed with an algebraic structure. There are more axioms for rings and fields than there are for groups and two operations instead of only one. The extra axioms with the accompanying distributive law can make some properties of rings more familiar than for groups.

One of the great advantages of studying mathematics is that it helps one develop the ability to handle abstract ideas. Abstract algebra allows us to cultivate this ability with concrete examples, mathematical rigour, and beautiful applications. The study of algebra involves topics that are important branches of mathematics that are thriving and intriguing in their own right while hosting many applications to subjects such as number theory, geometry, and analysis. For example, central in ring theory is an ideal which was introduced by Kummer in his work on the famous Fermat’s Last Theorem. A second example comes from 19th century work on solving polynomial equations – work that led to Galois theory which will be a topic in our course.

After successful completion of the course, students will be able to state, prove, apply fundamental theorems, and construct and work with a variety of concrete examples. Topics will include modules, groups, fields, and Galois theory.

Homework Sets: We will assign homework on a weekly basis. Exercises will be assigned in class on Wednesdays and solutions will be due by 5:00 p.m. the following Wednesday (submitted to the mailbox of the appropriate instructor as announced in class). The first assignment will be due Wednesday, January 21. Assignments will also be listed on the course web-page. Each section of homework will be worth the same amount. Late homework will only be accepted under unavoidable, documentable circumstances. If you know in advance of a conflict with one of the homework due dates, you are responsible for making alternative arrangements or informing us beforehand.

Students are encouraged to work on assignments in small groups, but each member of the class is required to turn in their own neatly written, organized set of solutions. Students will receive no credit for solutions with no work or justification. We reserve the right to deduct points for messy papers. You may even consider using L^AT_EX to typeset your solutions.

Exams: There will be one two-hour midterm exam and one two-hour final examination.

The midterm exam will be written outside of class during the ninth week of classes (the week of March 9). The precise date and time of the exam will be announced early in the semester. You will be allowed to use one 2-sided sheet (8.5×11) of hand-written notes during the midterm exam. No homework assignment will be due the week of the midterm exam.

The final examination will be comprehensive and will last 2 hours (see the Tentative Schedule). You will be allowed to use one 2-sided sheet (8.5×11) of hand-written notes during the final exam.

Make-up exams will only be allowed under unavoidable, documentable circumstances. If you know in advance of a conflict with one of the exam dates, you are responsible for making alternative arrangements or informing us beforehand.

Attendance and Participation: While attendance is not explicitly required, it is worth 10% of your grade. We will take attendance each class period. Officially excused absences will not be counted against you, but you must document such situations with us personally.

Classroom Atmosphere and Courtesy: A part of learning is making mistakes. We want to establish a classroom atmosphere where the inevitable false starts and mistakes become an opportunity to improve – not an opportunity for embarrassment. Please be constructive and polite in questioning your colleagues in class.

In addition, cellular telephones, pagers, and other similar devices are not to be used and are to be turned off or set to vibrate-mode during class-time. Students violating this policy will receive one warning per semester. After the warning, violations will result in the loss of attendance credit for the day.

Missed/Late Work Policies: Late submissions of homework and make-up exams will only be granted for unavoidable, documented circumstances as described below:

Circumstance	Required Documentation
Illness or other medical situation	Official note from clinic, hospital, doctor, nurse, or other health care provider
Military service	Official military activation orders
Funeral or other family emergency	Official documentation from newspaper, funeral, or medical official
Sports or other official NDSU activity	Official documentation from NDSU athletics or activity's faculty adviser

Please note that recreational activities do not qualify for make-ups or late submissions. If you have a pre-existing conflict with an exam, homework deadline or class meeting, you are expected to make alternative arrangements *beforehand*. You are also permitted to submit an assignment before its given deadline.

Course Grades: Student grades are based on approximately thirteen homework assignments, one midterm exam, one final exam, attendance, and participation. We will update your grades throughout the semester at the NDSU Blackboard site. Weights are summarized in the following table along with grade ranges.

Task	Percentage of Grade
Homework Sets	50%
Midterm Exam	20%
Final Exam	20%
Attendance & Participation	10%

Percentage Grade	Grade Earned
85% – 100%	A
75% – 84.9%	B
60% – 74.9%	C
50% – 59.9%	D
0% – 49.9%	F

Tentative Course Schedule:

Event	Date(s)
Martin Luther King Day (no class)	Monday, January 19
Presidents' Day (no class)	Monday, February 16
Midterm Exam	Week of March 9 (date and time TBA)
Spring Break (no classes)	Monday, March 16–Friday, March 20
Spring Recess (no classes)	Friday, April 3–Monday, April 6
Last Day of Classes	Friday, May 8
Final Exam	Tuesday, May 12, 8:00–10:00 a.m.

Announcements: Periodically, we will send course announcements to your ndsu.edu email account. It is your responsibility to check this email account regularly.

ADA Statement: The Americans with Disabilities Act requires that reasonable accommodations be provided for students with physical or cognitive disabilities in order to ensure their equal access to course content. If you have a documented disability and require accommodations, please let your instructors know as soon as possible. For more information, please contact Student Disability Services at 231-7671 or go to <http://www.ndsu.edu/disabilityservices/>.

Academic Honesty: The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

Any student found guilty of academic dishonesty will receive a grade of 0 for the task in question. In addition, every such student will be reported to the Chair of Mathematics, the Dean of their major college, the Dean of the College of Science and Mathematics, the Provost, and the Registrar. The Registrar will add any such student to NDSU's Student Academic Misconduct Database. (Multiple entries in this database may result in additional sanctions from NDSU.) Students found guilty of a second offense of academic dishonesty in this class will receive a course grade of F, and will not be allowed to drop or withdraw from the course.

Veterans: Veterans and student soldiers with special circumstances or who are activated are encouraged to notify the instructors in advance.