MATH 725, Theory of Rings II, 3 credits, Fall 2012
MWF 9:00-9:50 AM, Minard Hall 336

INSTRUCTOR: Sean Sather-Wagstaff OFFICE: Minard Hall 428E
E-MAIL: `Sean.Sather-Wagstaff@ndsu.edu` PHONE: 231-8105
OFFICE HOURS: M 2:00-2:50, T 2:30-3:20, W 3:30-4:20, R 12:00-12:50, or by appointment

PREREQUISITE: MATH 721

USEFUL WEBPAGES:
Course webpage: `http://www.ndsu.edu/pubweb/~ssatherw/fa12/725/`
Instructor webpage: `http://www.ndsu.edu/pubweb/~ssatherw/`
Anonymous evaluation form: `http://www.ndsu.edu/pubweb/~ssatherw/ssw-eval.html`
Math department webpage: `http://math.ndsu.nodak.edu/`
NDSU webpage: `http://www.ndsu.edu`
NDSU blackboard site: `https://bb.ndsu.nodak.edu/`
NDSU webpage on academic honesty: `http://www.ndsu.edu/academichonesty/`

TEXT: None required. Much of the course will be based on the text "Commutative Ring Theory" by Matsumura. You may also consider purchasing "Introduction to Commutative Algebra" by Atiyah and MacDonald.

COURSE DESCRIPTION: The ideal theory of commutative rings, structure of (non-commutative) rings, and selected advanced topics.

COURSE GRADES: Student grades are based on homework assignments, attendance, and participation. Weights are summarized in the following table along with grade ranges.

Homework	90%
Attendance and Participation	10%

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

I will update your grades throughout the semester at the NDSU Blackboard site.

HOMEWORK: I will assign homework on a bi-weekly basis. Exercises will be assigned in class on Fridays and solutions will be due on the Friday two weeks later, preferably in class. Assignments will also be listed on the course webpage. Each section of homework will be worth the same amount. Late homework will be accepted, but only if you make alternative arrangements with me beforehand.

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

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

COURSE NOTES: I will not be typing course notes during the semester.

TENTATIVE SCHEDULE:

Labor Day holiday (no class)	Mon 03 Sep
KUMUNU meeting (no class)	Fri 21 Sep
Akron AMS meeting (no class)	Fri 19 Oct and Mon 22 Oct
Tucson AMS meeting (no class)	Fri 26 Oct
Veteran's Day holiday (no class)	Mon 12 Nov
Thanksgiving holiday (no class)	Thu 22 Nov–Fri 23 Nov
Classes end	Fri 07 Dec

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

INSTRUCTOR FEEDBACK: At the course webpage, there will be a link to an anonymous evaluation form where students can submit comments or suggestions for me at any time during the semester.

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 instructor know as soon as possible. For more information, please contact Student Disability Services at 231-7671 or go to `http://www.ndsu.edu/counseling/disability.shtml`.

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 `http://www.ndsu.edu/academichonesty`.

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

TENTATIVE LIST OF TOPICS (time permitting)

1. Depth (SSW HA Chapter V)
2. Noetherian Hodgepodge (Matsumura, selected topics from Sections 1–3)
3. Nullstellensatz and Dimension Theory (Matsumura, Section 5)
4. Artin-Rees Lemma and Krull's Intersection Theorem (Matsumura, part of Section 8)
5. Integral Extensions (Matsumura, Section 9)
6. Graded Rings, Hilbert Functions, Samuel Functions (Matsumura, Section 13)
7. System of Parameters (Matsumura, part of Section 14)
8. Regular Sequences and the Koszul Complex (Matsumura, Section 16)
9. Cohen-Macaulay Rings (Matsumura, Section 17)
10. Ext, Tor, and Homological Dimensions (SSW HA Chapter VII)
11. Depth and Homological Dimensions (SSW HA Chapter IX)
12. Regular Local Rings (SSW HA Chapter X)