Introduction to Commutative Algebra and Algebraic Geometry  
Math 8240 Section 005, CRN-86693, Fall 2014

Instructor: Florian Enescu  
Classroom: AH 319  
Class timings: M W 1:30 – 2:45pm  
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Phone: (404) 413-6442  
Office Hours: Monday 3-4pm Friday 10-11pm and by appointment.

Recommended textbook: 
*An Algebraic Introduction to Complex Projective Geometry I. Commutative algebra*  

Webpage: http://www2.gsu.edu/~matfxe/currentclasses

Other recommended texts:  
H. Matsumura, Commutative ring theory, Cambridge University Press  
H. Matsumura, Commutative algebra, Benjamin, second edition, 1980  
D. Eisenbud, Commutative algebra with a view towards algebraic geometry, Springer-Verlag  
I. Kaplansky, Commutative rings, Chicago University Press  
F. Enescu, Lecture notes on commutative algebra, at [http://www2.gsu.edu/~matfxe/classes](http://www2.gsu.edu/~matfxe/classes)

Course content/outcome: The course offers a solid introduction in commutative algebra and algebraic geometry. The basic concepts will be rigorously introduced and emphasized through examples. Among the major tools developed, we mention Grobner bases, primary decomposition for ideals and submodules, graded rings and modules, Zariski topology, irreducible varieties, dimension, the Hilbert-Samuel polynomial.

This course will emphasize the understanding of the concepts, through examples and proof writing. The students passing the course will be able to present the proofs of the majors results as well as apply them in the solving of routine exercises. The class will offer a solid foundation to students planning to specialize in those areas of mathematics, as well as algebraic number theory, complex analysis, or complex geometry.

**Prerequisites:** MATH 8220 with a grade of C or higher.

**Grading scheme for Math 8240:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Hwk</td>
<td>60 %</td>
</tr>
<tr>
<td>Exam 1</td>
<td>20 %</td>
</tr>
<tr>
<td>Final exam</td>
<td>20 %</td>
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</tbody>
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**Monday, October 13**

**Wednesday, December 10**

**Homework:** There will be weekly homework assignments that will be graded. No late homework will be accepted. You can discuss the problems among yourselves, but the write-up of the solutions has to be done individually according to your own understanding. Identical assignments will not be graded.
Exams: There will be one midterm exams and one final exam. The final exam is comprehensive and required.

Using the above weights, letter grades will be assigned (roughly) as follows:

- 97–100 = A+
- 93–96 = A
- 90–92 = A-
- 87–89 = B+
- 83–86 = B
- 82–80 = B-
- 77–79 = C+
- 70–76 = C
- 60–69 = D
- less than 60 = F.

Attendance: You are expected to attend regularly for the entire period of the class. That is, you are expected to arrive on time and stay for the duration of the class. After four or more absences a student can be dropped from this class. In case of an absence, the student is responsible for knowing all the material covered.

Important dates: Last day to drop a class: August 29, on GoSolar. A student that does not attend the first two weeks can be dropped by the instructor.

Last day to withdraw from term length classes and possibly receive a W: October 14, 2014.

Disruptive behavior: Any disruptive behavior will be handled according to the University’s policy on disruptive behavior (http://www.gsu.edu/~wwsen/minutes/2002-2003/disrupt.html). This includes the possibility of withdrawing the student from the class.

Academic honesty: Academic honesty is expected from any student. Cheating will not be tolerated and handles according to the University’s policy on academic honesty (http://www.gsu.edu/~wwdos/codeofconduct_conpol.html) which includes academic as well as disciplinary penalties.

Special accommodations: Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

Changes: Any changes to the above syllabus will be announced in class. The course syllabus provides a general plan for the course; deviations might be necessary.

Webpage: http://www2.gsu.edu/~matfxe/currentclasses