

Math U575 Group Theory –Spring 2008

Syllabus for Prof. Iarrobino section

Text: *Contemporary Abstract Algebra*, 6th ed. J. Gallian, Houghton-Mifflin
ISBN: 0-618-51471-8

Prerequisite: Linear algebra Math U371

Time: Monday, Wednesday, Thursday 10:30-11:35 AM. **Room:** 178F WV

Instructor: Prof. Anthony Iarrobino, 526 NI, x 5524, e-mail a.iarrobino@neu.edu
(e-mail is usually a very quick way to contact me, please address "Prof. Iarrobino" and also "sign" – indicate clearly who you are as sender.)

Office Hours: Monday 3-5, Wednesday 1-3, Thursday 1-3

To talk to someone else: Prof. Alex Martsinkovsky, Undergraduate Director, Mathematics Department, 447 Lake, x 5679, alexmart@neu.edu

Class notes website: With brief synopsis of class, HW assignments, additional resources, announcements. I plan to update this about twice a week.

<http://www.math.neu.edu/~iarrobino/AIMathU575Spring08.html>

I will also use Blackboard for announcements, and post syllabus there, but I prefer this math department site for the classnotes. There will be a link to it from Blackboard.

Grading: 30 minute quizzes (about 8 quizzes, the lowest grade drops): the average of the quiz grades, together with a contribution of up to 5% from HW or in class participation is 40% of the grade. One hour exam is 20%. Final exam 40%. Optional work such as a project or presentation: may replace 5% to 20% of classwork/quizzes or final, if arranged with instructor and agreed to in writing by February 25. **Final exam** is required of all, two hours, Tuesday April 22 at 10:30 AM.

HW: HW will be assigned, primarily from the syllabus below, and occasionally checked. You may pass your collected HW or notebook in at the final exam for an Extra Credit HW grade, that contributes to the quiz-HW grade. I will pass these back to you at the end of the final exam.

Classwork in small groups: I will assign and reassign groups of about 3 to work on/discuss problems in class.

Topics: The course introduces the basic ideas and applications of group theory, including symmetry groups, abelian, cyclic, permutation groups. Also subgroups, normal subgroups, group homomorphisms, quotient groups, direct products. The theory will be illustrated by examples from geometry, linear algebra and combinatorics. We will cover chapters 1-11 of text, perhaps some topics from Chapters 24-27 if time permits. Part of the time in each class will be devoted to solving problems in group theory from the text or that we choose.

Goals: A. Students will understand the basic ideas and some applications of groups. Students will be able to explain groups, factor groups as a formalization of properties of symmetry. Students will recognize mathematical objects that are groups, and be able to classify them as abelian, cyclic, direct products, etc. Students will understand homomorphism of and quotients of groups, and be able to determine when a group has a normal subgroup, or a quotient.

B. Students will be able to reason mathematically, to write simple proofs, and are able to judge when an attempted proof in group theory is correct/complete or is not.

C. Students will have a chance to reflect on doing mathematics, solving problems and our role and progress as mathematicians.

Suggested homework exercises (Chaps 0-11).

Chapter 0: 1,2,4,7,8, 9,11,14,18,19,20,49,50.

Chapter 1: 5,9,12,13,17,19,21,22.

Chapter 2: 9,14,15,16,20,22,23,25,32,34,36,37.

Chapter 3: 2,3,10,14,15,16,18,20, 28,29,51,52.

Chapter 4: 1-10,14,21,27,28,49,50,63,64,65.

Supplementary Ex: p. 90: #1-10,17.

Chapter 5: 1-9,17,18,23,24,25,26,27,28,54,55.

Chapter 6: 1-10, 22,23,25,32,33,35.

Chapter 7: 1-9,13,14,16,18,30,31,41,42,43,44,46.

Chapter 8: 1-20,49

Supplementary Ex. p. 174 #5-7,13,14,25-26,50.

Chapter 9: 1,3,4,5,6,8,10,14,15,16,17,18,50,51.

Chapter 10: 5-22,48,53.

Chapter 11: 1-10, 12-20.

Supplementary Ex. p. 230 #1,13,15,19.

Academic Honesty: It is fine to work together to do homework (studies have shown this can be particularly helpful in learning math), provided such assistance is acknowledged specifically in any work passed in, and that you understand what you pass in. Collaboration on quizzes and exams is not allowed, unless I make a specific exemption for a quiz, announced in advance. In any presentation or project, resources used and sources of assistance must be acknowledged in a professional way.

Student Code of Conduct: see <http://www.northeastern.edu/osccr/academichonesty.html> or Student Handbook 2007-2008 p. 38-39.

" Essential to the mission of Northeastern University is the commitment to the principles of intellectual honesty and integrity.

Academic integrity is important for two reasons. First, independent and original scholarship ensures that students derive the most from their educational experience and the pursuit of knowledge. Second, academic dishonesty violates the most fundamental values of an intellectual community and depreciates the achievements of the entire University community. Accordingly, Northeastern University views academic dishonesty as one of the most serious offenses that a student can commit while in college."

The website/handbook goes on to detail examples. In Math U575, academic dishonesty on a quiz or exam, or assignment leads to a zero on the quiz or exam or assignment, that cannot be made up, as well as a letter detailing the incident to the Office of Student Conduct and Conflict Resolution. The minimum penalty for a finding of academic dishonesty by the student Judicial Hearing Board includes one year disciplinary probation.

Incomplete grade: requires a written understanding (contract) between the Instructor and student with details about what material will be made up and how. Incompletes are normally appropriate only for a student who is doing well, but becomes ill, or has a family emergency late in the semester.