

# MATHEMATICS 4P14/5P11 (Winter 2012)

## Group Rings

- Professor: Dr. Yuanlin Li  
Room MC J422  
Email: yli@brocku.ca  
Home Page: <http://spartan.ac.brocku.ca/~yli/4P14-5P11/4P14-5p11w12.html>
- Lectures: TR: 3:30 - 5:00 pm (WH305)
- Tutorials: T: 2:00 - 3:00 pm (WH203)
- Office Hours: TR: 11:00 - 12:00 or by appointment
- Textbooks: *An Introduction to Group Rings*, first edition, by Cesar Polcino Milies and S. K. Sehgal, Kluwer Academic Publishers, 2002.
- Prerequisite: MATH 3P13 (and Math 4P11\*)
- Marking Scheme:
- Three Assignments: 40%
  - Midterm Exam: 30%
  - Course Project (regarded as the final exam): 30%
- Course Content: This course covers several fundamental topics in group rings and the details are as follows:
1. Preliminaries: Group theory (FC groups, Free groups, Hamiltonian groups)(chapter 1); Rings and Modules (Chapter 2).
  2. Group rings: Group rings and their unit groups; Augmentation and other ideals; Algebraic elements; Several important types of units; Isomorphism problem; Free groups of units, Integral group rings and group algebras(chapters 3-11).
- Course Project: This project will help you develop your research abilities. Under graduate students may work in a group of two while graduate students are expected to work on your own. Several topics will be given, and each group will choose a topic from the given list. No two individual groups should choose the same topic. In order to complete the project, you will need to study reference books, journal articles related to your chosen topic. Research papers and books can be found from the library, through an inter-library loan, through an internet search, or by using academic databases such as “mathsciencenet”. More detailed instructions will be given in class. An outline of your project is due on Feb. 3, a draft copy (optional) is due on March 23, and the final copy is due on March 30. Each group will also be expected to give a presentation of its project in the last week of class. Your marks for the project will be based on both your final copy and your presentation.

## Exams and Assignments:

Exam	Date	Mark
Midterm	Tuesday, March 6	30%
AS #	Due Date	Mark
1	Friday, Jan. 27	14%
2	Friday, Feb. 17	13%
3	Friday, March 16	13%
Project	Due Date	Mark
Outline	Feb. 3	2%
Draft Copy	March 23	optional
Final Copy	March 30	20%
Presentation	Last week	8%

### Notes:

- (1) The Midterm exam will be 60 minutes long and held during the regular lecture time. There is no final exam and your research project will be regarded as the final exam.
- (2) To pass the course both a passing mark and a score of at least 50 % on the project are required.
- (3) **This course also emphasizes good mathematical writing. Students will be expected to write their solutions to assignments using a very readable and logical mathematical style.** The assignments are due at 4 pm on the due dates. **No late assignments will be accepted.** The solution to each homework will be posted after the due date. Please attach a cover page to your assignment. This should bear (at the top) **your name, student number, course number and assignment number.** A sample cover page can be found in the **Course Home Page.**
- (4) **Plagiarism:** You may discuss the problems with other students; however, **the final submitted work must be your own.** Any evidence of copying will result in a mark of 0.
- (5) **Withdrawal Date:** Friday, March 9, 2012 is the **last date** for withdrawal from the course **without academic penalty.**