

**Faculty of Science Course Syllabus
Department of Mathematics & Statistics
MATH 4070/5070 – Algebraic Number Theory
Fall 2018**

Instructor(s): Karl Dilcher dilcher@mathstat.dal.ca Chase 325

Lectures: Mondays, Wednesdays, Fridays 9:35—10:25 am Chase 227 (Seminar Room)

Office Hours: To be determined

Course Description (calendar entry):

An introduction to algebraic number theory, with special emphasis on quadratic and cyclotomic fields. A more general study of rings of integers of algebraic number fields focuses on divisibility properties. Other topics include Dedekind domains, ideals and their factorization into prime ideals, and class groups and class numbers.

Course Prerequisites

MATH 3032 (MATH 3070 recommended).

Course Objectives/Learning Outcomes

The student will gain a solid understanding of the basics of algebraic number theory. This course will serve as a basis for further studies in number theory or algebra.

Course Materials

- Course Notes: “Algebraic Number Theory”; available in class.
- Textbook: “Algebraic Number Theory and Fermat’s Last Theorem, 3rd Ed., by Ian Stewart and David Tall, AK Peters, 2001. (Not required; a copy is on reserve in the Killam Library.)

Course Content

1. Introduction
2. Algebraic Background
3. Algebraic Numbers
4. Quadratic and Cyclotomic Fields
5. Factorization into Irreducibles
6. Ideals
7. Class Groups and Class Numbers
8. Fermat’s Last Theorem

Course Assessment

Component	Weight (% of final grade)	Date
<i>Midterm test</i>	30%	<i>to be announced</i>
<i>Final exam</i>	40%	<i>to be announced</i>
<i>Assignments</i>	30%	<i>weekly</i>

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

Course Policies

Late assignments will normally not be accepted. However, reasonable accommodations will be made in the case of special circumstances. Detailed guidelines and instructions concerning assignments will be handed out with the first assignment.

Difference between MATH 4070 and MATH 5070: The course content will be the same for both undergraduate and graduate students. However, half of the questions on the take-home and a quarter of the questions of the final exam will be different, and more challenging, for students registered in MATH 5070.