PMath 441/641 – Spring 2024

Algebraic Number Theory
Detailed Course Outline

The third column contains the section in the course notes corresponding to the topic to be covered that day in lecture, described in the fourth column.

Date	Day	Notes	Topic	
6 May	Monday	1	What is an algebraic integer?	
8 May	Wednesday	13	Modules	
10 May	Friday	2	The ring of algebraic integers	
13 May	Monday	3	Norm and trace	
15 May	Wednesday	3	Additive structure of $\mathcal{O}_K$	**Homework 1 due**
17 May	Friday	3	Dedekind domains	**Quiz 1**
20 May	Monday	—	**Victoria Day holiday**	
21 May	Tuesday	4	Geometry of numbers	
22 May	Wednesday	4	Minkowski space	**Homework 2 due**
24 May	Friday	4	More geometry of numbers	**Quiz 2**
27 May	Monday	5	Discriminants	
29 May	Wednesday	5	Norm and trace	**Homework 3 due**
31 May	Friday	5	Norm of an ideal	**Quiz 3**
3 June	Monday	5	Norms and discriminants	
5 June	Wednesday	6	Ideals of $\mathcal{O}_K$	**Homework 4 due**
7 June	Friday	16	Finite rings	**Quiz 4**
10 June	Monday	6	Factoring ideals	
12 June	Wednesday	6	More factoring	**Homework 5 due**
14 June	Friday	7	More factoring of ideals	**Quiz 5**
17 June	Monday	7	Fractional ideals	
19 June	Wednesday	7	Fractional ideals	**Homework 6 due**
21 June	Friday	7	Dividing by ideals	**Quiz 6**
24 June	Monday	18	Local rings and DVRs	
26 June	Wednesday	18	Local rings and DVRs	**Homework 7 due**
28 June	Friday	8	Norm ideals are multiplicative	**Quiz 7**
1 July	Monday	—	**Canada Day holiday**	
3 July	Wednesday	8	Yet more ideal factoring	**Homework 8 due**
5 July	Friday	8	Computing rings of integers	**Quiz 8**
8 July	Monday	8	Ramification and discriminants	
10 July	Wednesday	9	The class group	
12 July	Friday	9,15	Computing the class group	
15 July	Monday	9-10,15	More computing the class group	
17 July	Wednesday	10	Computing the class group	**Homework 9 due**
19 July	Friday	10	Still computing the class group	**Quiz 9**
22 July	Monday	11	Units of $\mathcal{O}_K$	
24 July	Wednesday	11,15	Dirichlet's Unit Theorem	
26 July	Friday	12	Showing an ideal is not principal	
29 July	Monday	—	Review	**Quiz 10 & Hmwk 10 due**