## **Course Outline (Tentative)**

Week	Date	#	Sections	Topics
1	Mon Jun 21	1	1.1	Review of sets and functions. The division algorithm in Z.
		2	1.2	Divisibility, GCD's, and the Euclidean algorithm in Z.
	Tue Jun 22	3	1.3	Prime numbers and unique factorization in Z.
		4	2.1	Equivalence relations, equivalence classes, and quotients. Congruence and congruence classes in Z.
	Wed Jun 23	5	2.2	Modular arithmetic: addition and multiplication in Z/nZ.
			Review	
2	Mon Jun 28	6	2.3	The structure of Z/pZ when p is prime.
		7	3.1	Rings: basic definitions and examples.
	Tue Jun 29	8	3.2	Rings: basic properties.
		9	3.3	Ring isomorphisms and ring homomorphisms.
	Wed Jun 30	10	3.3	Ring isomorphisms and ring homomorphisms cont'd.
			Review	
3	Mon Jul 05		Holiday	Independence Day
	Tue Jul 06		Exam	Midterm 1 (Covers sections 1.1 - 3.3)
		11	4.1	Polynomials over a ring R. The division algorithm in F[x] for a field F.
	Wed Jul 07	12	4.2	Divisibility, GCD's, and the Euclidean algorithm in $F[x]$ for a field F.
			Review	
4	Mon Jul 12	13	4.3	Irreducible polynomials and unique factorization in F[x] for a field F.
		14	4.4	Polynomial functions and roots. Factoring and reducibility of polynomials.
	Tue Jul 13	15	4.5	Irreducibility in Q[x].
		16	5.1	Congruence and congruence classes in F[x] for a field F.
	Wed Jul 14	17	5.2	Congruence class arithmetic: addition and multiplication in $F[x]/(p(x))$ .
			Review	
5	Mon Jul 19		Exam	Midterm 2 (Covers sections 4.1 - 5.1)
		18	5.2 - 5.3	Congruence class arithmetic: addition and multiplication in $F[x]/(p(x))$ , cont'd.
	Tue Jul 20	19	5.3	The structure of F[x]/(p(x)) when p(x) is irreducible.
		20	6.1	Ideals in a ring. Congruence and congruence classes in a ring.
	Wed Jul 21	21	6.2	Congruence class arithmetic: addition and multiplication in a ring modulo an ideal.
			Review	
6	Mon Jul 26	22	6.2	Kernels, induced homomorphisms, and the first isomorphism theorem for rings.
		23	6.3	The structure of R/I when I is a prime ideal or a maximal ideal.
	Tue Jul 27	24	9.1 - 9.2	PID's, UFD's, and Euclidean domains.
		25	9.1 - 9.2	PID's, UFD's, and Euclidean domains, cont'd.
	Wed Jul 28	26	9.3	Factorization in quadratic fields.
			Review	