Schedule

A week-by-week breakdown of the material.

Week 1 (09/05-09/09)

- Day 1
  - Numbers: Rationals, Reals, Complex[1]
  - Basic proof techniques: Direct[2]
  - Assignment 1[3]
- Day 2
  - Basic proof techniques: Indirect[4]
  - Square root of 2 is irrational[5]
  - Quantifiers[6]
- Day 3
  - Principle of Mathematical Induction[7]
  - Strong induction and Well-Ordering Principle[8]
  - Fibonnaci Numbers[9]
  - Assignment 2[10]

Week 2 (09/12-09/16)

- Day 1
  - Divisibility[11]
  - Prime and Composite Numbers[12]
  - Assignment 3[13]

[1] notes/numbers_intro.html
[2] notes/proofs_basic.html
[3] assignments/1.html
[4] notes/proofs_basic.html
[5] notes/irrationality_of_sqrt2.html
[6] notes/proofs_quantifiers.html
[7] notes/proofs_induction.html
[8] notes/proofs_induction_other.html
[9] notes/numbers_fibonacci.html
[10] assignments/2.html
[11] notes/numbers_divisibility.html
[12] notes/primes_intro.html
[13] assignments/3.html

- Day 2
  - Patterns in the Primes[14]
  - Common Divisors[15]
- Day 3
  - The Division Theorem[16]

Week 3 (09/19-09/23)

- Day 1
  - A weird number system[17]
  - The Division Theorem (cont)[18]
  - Assignment 4[19]
- Day 2
  - The Euclidean Algorithm[20]
  - Diophantine Equations[21]
- Day 3
  - Euclidean Division and Diophantine Equations[22]
  - Finding all Solutions[23]
  - Assignment 5[24]

Week 4 (09/26-09/30)

- Day 1
  - Fundamental Theorem of Arithmetic[25]
  - Consequences of Fundamental Theorem[26]

[14] notes/primes_patterns.html
[15] notes/numbers_gcd.html
[16] notes/numbers_division_theorem.html
[17] notes/weird_number_system.html
[18] notes/numbers_division_theorem.html
[19] assignments/4.html
[20] notes/numbers_euclidean_algorithm.html
[21] notes/equations_diophantine_intro.html
[22] notes/equations_diophantine_and_euclidean.html
[23] notes/equations_diophantine_all_solutions.html
[24] assignments/5.html
[25] notes/numbers_fundamental_theorem.html
[26] notes/numbers_fta_consequences.html

- Day 2
  - Modular Arithmetic and Congruences[27]
- Day 3
  - Arithmetic with Congruences[28]

Week 5 (10/03-10/07)

- Day 1
  - Chinese Remainder Theorem[29]
  - Assignment 6[30]
- Day 2
  - Congruence Classes as a Number System[31]
- Day 3
  - Multiplicative Inverses[32]

Week 6 (10/10-10/14)

- Day 1
  - Basics of Encryption[33]
  - Encryption via Multiplication[34]
- Day 2
  - MIDTERM (Study guide[35])
- Day 3
  - Fermat's Little Theorem[36]
  - Assignment 7[37]

[27] notes/congruence_intro.html
[28] notes/congruence_arithmetic.html
[29] notes/congruence_chinese_remainder.html
[30] assignments/6.html
[31] notes/congruence_system.html
[32] notes/congruence_multiplicative_inverses.html
[33] notes/encryption_basic.html
[34] notes/encryption_mult.html
[35] notes/studyGuide1.html
[36] notes/congruence_fermats.html
[37] assignments/7.html

Week 7 (10/17-10/21)

- Day 1
  - Fall Break
- Day 2
  - Reduced Residues and phi[38]
- Day 3
  - Reduced Residues and phi (cont)[39]

Week 8 (10/24-10/28)

- Day 1
  - Reduced Residues and phi (cont)[40]
  - Euler's Theorem[41]
  - Assignment 8[42]
- Day 2
  - Encryption via Exponentiation[43]
- Day 3
  - Public Key Cryprography and RSA[44]

Week 9 (10/31-11/04)

- Day 1
  - Public Key Cryprography and RSA (cont)[45]
- Day 2
  - Order of Elements in Zn[46]

[38] notes/residues_basic.html
[39] notes/residues_basic.html
[40] notes/residues_basic.html
[41] notes/residues_eulers_theorem.html
[42] assignments/8.html
[43] notes/encryption_exponentiation.html
[44] notes/encryption_rsa.html
[45] notes/encryption_rsa.html
[46] notes/residues_order.html

- Day 3
  - Polynomials over Zn[47]

Week 10 (11/07-11/11)

- Day 1
  - Primitive Roots[48]
- Day 2
  - Primitive Roots (cont)[49]
- Day 3
  - MIDTERM (Study guide[50])

Week 11 (11/14-11/18)

- Day 1
  - Applications of Primitive Roots: Diffie-Hellman protocol[51]
- Day 2
  - Applications of Primitive Roots: Diffie-Hellman protocol (cont)[52]
  - Quadratic Residues[53]
  - Assignment 9[54]
- Day 3
  - Quadratic Residues (cont)[55]

[47] notes/residues_polynomials.html
[48] notes/residues_primitive_roots.html
[49] notes/residues_primitive_roots.html
[50] notes/studyGuide2.html
[51] notes/encryption_diffie_hellman.html
[52] notes/encryption_diffie_hellman.html
[53] notes/residues_quadratic.html
[54] assignments/9.html
[55] notes/residues_quadratic.html

Week 12 (11/21-11/25)

- Day 1
  - Law of Quadratic Reciprocity[56]
- Day 2
  - Thanksgiving
- Day 3
  - Thanksgiving

Week 13 (11/28-12/02)

- Day 1
  - Gauss's Lemma[57]
- Day 2
  - Proof of Quadratic Reciprocity[58]
  - Assignment 10[59]
- Day 3
  - Primality Tests[60]

Week 14 (12/05-12/09)

- Day 1
  - Primality Tests (cont)[61]
- Day 2
  - TBA
- Day 3
  - TBA

[56] notes/residues_reciprocity.html
[57] notes/residues_reciprocity.html
[58] notes/residues_reciprocity_proof.html
[59] assignments/10.html
[60] notes/primes_testing.html
[61] notes/primes_testing.html