MATERIAL TO STUDY FOR MATH 788F

I have tried to list below the main topics covered in the course. If a topic is not to be included as part of the comprehensive exam, I have written "omit" next to the topic. If I expect you to know the proof(s) associated with a given topic, I have indicated so beside the topic. My typed notes for the course may have changed since you took the course and, in particular, the numbers of theorems may be different, so I have tried to avoid references to numbers of theorems below. If you have any questions regarding the meaning of a topic below, please see me (or send an e-mail message to me).

(1) Gauss' Theorem connecting irreducibility over $\mathbb{Q}$ with irreducibility over $\mathbb{Z}$ (know proof)

(2) The Schönemann-Eisenstein Criterion (know a proof)

(3) Determining if a polynomial is Eisenstein

(4) Newton polygons (definitely on test, maybe more than once)

(5) Perron's Theorem (know proof given the lemma)

(6) A. Cohn's and G. Pólya's Theorem concerning $f(10)$ being prime (know proof of the theorem and the lemma to the theorem)

(7) Formal Power Series and the results based on them (omit)

(8) Cyclotomic Polynomials

(9) The theorem that there are infinitely many primes $\equiv 1 \pmod{n}$ for any positive integer n (know proof)

(10) Kronecker's theorem that a monic irreducible polynomial with all its roots on the unit circle is cyclotomic (know proof)

(11) The factorization of $\Phi_n(x)$ modulo a prime p

(12) Bessel Polynomials (omit)