Study Guide for Final, v. 0.9
The final emphasizes topics after the midterm (see below) but earlier material will be included to the extent that it can be compared with these later subjects (e.g. magnons vs. phonons) :

Drude model
Sommerfeld model & Sommerfeld expansion
Bloch's theorem, 2 proofs
  Crystal momentum, bands, velocity, Fermi surface
  Density of states, van Hove singularities
Nearly-free electron model
  Gaps, behavior near a Bragg plane, role of structure factor
  Extended, reduced, repeated zone schemes
  Fermi surface and Brillouin zones
  (Not spin-orbit coupling)
Tight-binding model
  LCAO, overlap, overlap integral, general features
  (Not Wannier functions)
  carbon nanotubes
Band structure
  Muffin tin, OPW, pseudopotential; (Not APW, KKR)
Semiclassical electron dynamics
  Equations of motion, consequences of model, holes
  Response to electric field, uniform magnetic field
  Closed orbitals, periods of extremal orbits, effective masses
  Basics of relaxation time approximation; (Not pp. 252-9)
  Landau levels, de Haas-van Alphen; Not "Other Fermi surface probes"
  Band structure of typical metals, esp. simple metals, noble metals
Semiconductors
  Gap, statistics, law of mass action, donor & acceptor levels
  pn & metal-semiconductor junctions, drift & diffusion currents, rectification
  Band bending, inversion layers
Beyond independent electrons
  Hartree, Hartree-Fock, Slater determinant, Slater exchange, exchange, correlation
  Screening, Thomas-Fermi, Lindhard
  Density functional theory, Kohn-Sham eqns., exchange-correlation potential, LDA, GGA
Basics of Fermi liquid theory (first part of Schofield article)
Pauli paramagnetism, rigid-band model (within Sommerfeld model), Stoner criterion
Heisenberg model for spins on a lattice, magnetic interactions in free electron gas
Spin waves/magnons, magnetic domains & their walls
Work function and its components
Universal curve of electron mean free path and its importance
Surface relaxations, energies, probes: LEED, STM and related scanning probes

Types of effective masses
Holes
Gaps
Dependencies on T, m, n, lattice structure, Bravais or not (i.e., basis)