GEO101 review for MidTerm #2

Deformation and Metamorphism

force and stress – what drives metamorphism
    response to stress – displacement, rotation and strain
    brittle vs ductile deformation
    compression, tension and shear
brittle deformation - joints and fractures
    faults – normal, reverse, strike-slip
folds
metamorphis structures – cleavage, foliation, lineations, folds
common metamorphic rocks – from sedimentary rocks, from igneous rocks
metamorphic responses – deformation, rotation, shearing
    small folding, pressure solution, recrystallization, remobilization
geologic settings of metamorphism – burial, subduction, heating, shearing
    change in pressure and temperature with depth
folds and growth of faults
compressional settings – deformation and metamorphism
    continent-continent collisions & fold-thrust belts
    ocean-continent convergent boundaries
extensional settings – deformation and metamorphism
    ocean basin rifting
    continental rifting
shear zones – deformation and metamorphism

Geologic Time

determining relative age –
    superposition, inclusions, baked contacts, original horizontality
unconformities – missing time – depositional hiatus –
        angular unconformity, disconformity, nonconformity
radioactive decay and isotopic ages
building and correlating the geologic time scale
geologic history of atmospheric composition – CO_2 and O_2
brief history of Precambrian time
    Hadean (4.5-4.0 Ga)
        oldest mineral
        Hadean environments and Hadean geology
    Archean (4.0-2.5 Ga)
        earliest continental crust
        first evolution of photosynthesis, but little O_2 in atmosphere, BIFs
    Proterozoic (2.5 – 0.5 Ga)
        agglomeration of Archean crust into cratons
        end of BIF – air had sufficient oxygen
        end of Proterozoic – Ediacaran fauna and Snowball Earth

Seafloor and continental margins

rock magnetism, paleomagnetism and magnetic reversals
seismic reflection surveys to reveal sub-seafloor sediments and structures
features of mid-ocean ridges, of deep sea floor, of subduction zones, island arcs, back-arc rifts
reefs and atolls
continental margins – shelf, slope, marine canyons, turbidity currents
    salt deposits and the history of seawater salinity