

**Final Exam Review Topics  
Fall 2007**

**Key Concepts**

Taxonomy, phenetic (Linnean) classification, cladistic classification, cladogram, shared-derived character, adaptive radiation, extinction, mass extinction

Phylogeny of dinosaurs - tetrapods, amniotes, diapsids, archosaurs

Skeletal traits that define the dinosauria - hole in the hip socket, three or more sacral vertebrae, asymmetric hand with two small outer digits

Saurischia (“lizard-hipped”), Ornithischia (“bird-hipped”)

The dinosaur cladogram: Ornithischians - Thyreophorans (Stegosaurs, Ankylosaurs), Ornithomimids (Iguanodontids, Hadrosaurs), Marginocephalians (Pachycephalosaurs, Ceratopsians); Saurischians - Sauropods, Theropods

The Triassic: Labyrinthodonts (frog-gators), synapsids (therapsids and true mammals), the evolutionary radiation of archosaurs (crocodile-normal - rhynchosaurs, crocodylians, rauisuchians, phytosaurs, aetosaurs; crocodile-reverse - ornithosuchians, lagosuchians, pterosaurs, dinosaurs). Evolution of dinosaurs - hole in the hip socket, upright posture, bipedal, initially carnivorous. Late Triassic dinosaurs - small theropods, prosauropods, small ornithischians. End Triassic extinction of most archosaur groups except dinosaurs, crocodiles, and pterosaurs. Triassic/Jurassic rift basins in the eastern US - Newark and Hartford Basins, deposits of lake and floodplain environments, as well as lava flows.

Theropods - carnivorous, bipedal, digitigrade (on 3 toes), Ceratosaurs, Carnosaurs (allosaurs), and Coelurosaurs (tyrannosaurs, oviraptors, troodontids, dromaeosaurs, ornithomimosaurs, segnosaurs, and birds)

Birds evolve from dromaeosaurid theropods (like *Velociraptor*). Key shared evolutionary novelties: elongated arms with claws, hollow bones, three-toed foot, furcula (fusion of clavicles into wishbone), grasping three-fingered hand, semi-lunate carpal.

Dinosaur extinction: volcanism, climate change, disease, asteroid impact, or all of the above? Evidence for asteroid impact: crater in Yucatan Peninsula, shocked quartz, tectites, iridium layer, tsunami deposits.