ANTH-UA 56 – Comparative Biology of the Living Primates

Mondays and Wednesdays 3:30-4:45
Room 706, 25 Waverly Place, Department of Anthropology

CONTACT INFORMATION
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Office Hours: W 10-12 and by appointment

SUMMARY OF COURSE
The study of the comparative anatomy of the primates, our closest living relatives, is fundamental to a sound understanding of human biology and evolution. This course surveys the anatomy of the living primates from a structural, functional and evolutionary perspective. The subject is reviewed topically by examining different anatomical systems and behaviors – external features, the cranium, dentition and dietary behavior, postcranial anatomy and locomotor behavior, sensory and nervous systems, dentition and dietary behavior, and reproductive anatomy. The role of comparative anatomy in functional and behavioral studies, taxonomy, and phylogenetic analyses is emphasized.

READINGS
(1) There is no formal textbook for this course.
(2) All students will need to buy a copy of The Pictorial Guide to the Living Primates by Noel Rowe (Pogonias Press, 1996), available in paperback. This book will be used throughout the course for reference and for class projects.
(3) Required readings are available on Blackboard. These are review articles and research papers from the primary literature (i.e., scientific journals and chapters from edited volumes) on comparative biology of the primates (and other mammals). They include a mix of historically important articles and recent advances.

REQUIREMENTS
(1) There will be no final exam.
(2) Five quizzes will be given during class (as shown in the course schedule), and will be based on readings and material covered in the previous classes. The lowest grade will be dropped from the final calculation. There will be no make-up quizzes. (40% of grade).
(3) Class reports will be assigned throughout the semester. These will consist of brief reports that discuss key issues or analyze comparative data (20% of grade).
(4) Class project at the Bronx Zoo on primate locomotor behavior (30% of grade).
Equivalent of a term paper.
(5) Class participation in discussion is critical to understanding the concepts and readings (10% of grade). It is important that you keep up with the readings and come prepared each class.
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<th>Date</th>
<th>Topic</th>
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<tr>
<td>January 23</td>
<td>Primates: taxonomy and zoogeography</td>
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<tr>
<td>January 25</td>
<td>Primate adaptive diversity</td>
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<td>January 30</td>
<td>Primate locomotion</td>
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<tr>
<td>February 1</td>
<td>Body size, allometry and sexual dimorphism</td>
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<td>February 6</td>
<td>External features</td>
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<td>February 8</td>
<td><strong>Practical Session 1: Skeleton (QUIZ 1)</strong></td>
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<td>February 13</td>
<td>External features</td>
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<td>February 15</td>
<td>Cranium</td>
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<td>February 20</td>
<td>Presidents’ Day (no classes)</td>
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<td>February 22</td>
<td>Sensory apparatus</td>
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<td>February 27</td>
<td>Brain size and anatomy</td>
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<td>February 29</td>
<td>Dietary behavior</td>
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<td>March 5</td>
<td>Dentition: Structure</td>
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<td>March 7</td>
<td><strong>Practical Session 2: Cranium &amp; Dentition (QUIZ 2)</strong></td>
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<td><strong>March 12</strong></td>
<td><strong>Spring Recess</strong></td>
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<td>March 19</td>
<td>Dentition: Diversity</td>
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<td>March 21</td>
<td>Dentition: Function and behavior</td>
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<td>March 26</td>
<td>Alimentary tract</td>
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<td>March 28</td>
<td><strong>Practical Session 3: Postcranial skeleton (QUIZ 3)</strong></td>
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<td>April 2</td>
<td>Musculo-skeletal system: biomechanics and functional morphology</td>
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<td>April 4</td>
<td>Axial skeleton</td>
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<td>April 9</td>
<td>Forelimb</td>
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<td>April 11</td>
<td>Hip</td>
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<td>April 16</td>
<td>Hip (AAPA meetings)</td>
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<td>April 18</td>
<td><strong>Practical Session 4: Axial skeleton &amp; forelimb (QUIZ 4)</strong></td>
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<td>April 23</td>
<td>Hind limb</td>
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<td>April 25</td>
<td>Hands and feet</td>
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<td>April 30</td>
<td>Reproductive anatomy and behavior</td>
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<td>May 2</td>
<td><strong>Practical Session 5: Hip and hindlimb (QUIZ 5)</strong></td>
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<td>May 7</td>
<td>Reproductive anatomy and behavior. <strong>No Final Exam – Zoo report due.</strong></td>
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Reading List: Comparative Biology of the Living Primates

All papers are available on Blackboard

January 25: Primate adaptations
Silcox et al. (2007): Primate origins and supraordinal relationships.

January 30: Locomotion
Hunt et al. (1996): Standardized descriptions of primate locomotor and postural modes.

February 1: Allometry and dimorphism
Martin (1990): The importance of body size.
Plavcan (2011): Understanding dimorphism as a function of changes in male and female traits.

February 6 & 13: External features

February 15: Cranium
Rae & Koppe (2004): Holes in the head.
Walker et al. (2008): The semicircular canal system and locomotion: The case of extinct lemuroids and lorisoids.
February 22: Sensory
Brennan & Keverne (2004): Something in the air?
Dominy et al. (2003): Historical contingency in the evolution of primate color vision.
Heffner (2004): Primate hearing from a mammalian perspective.
Jacobs (2003): Progress toward understanding the evolution of primate color vision.
Smith et al. (2001): Reappraisal of the vomeronasal system of catarrhine primates.
Tomasello et al. (2007): Reliance on head versus eyes in the gaze following of great apes and human infants.

February 27: Brain
Dunbar (2003): The social brain: Mind, language and society in evolutionary perspective.

February 29: Dietary behavior
Dominy et al. (2001): The Sensory ecology of primate food perception (also for Feb 22).
Lambert (2005): Competition, predation, and the evolutionary significance of the cercopithecine cheek pouch.

March 5: Dentition - structure
Lucas et al. (2008): Dental enamel as a dietary indicator in mammals.

March 21: Dentition- function
Semprebon et al. (2004): Can low-magnification stereomicroscopy reveal diet?
Strait (1997): Tooth use and the physical properties of food.

March 26: Alimentary tract
Martin (1990): Primate diets and dentitions.

April 2: Musculo-skeletal
Fleagle (1976): Locomotor behavior and skeletal anatomy of sympatric Malaysian leaf-monkeys.

April 4: Vertebrae
McCollum et al. (2010): The vertebral formula of the last common ancestor of African apes and humans.
Schultz & Straus (1945): The number of vertebrae in primates.
Whitcome et al. (2007): Fetal load and the evolution of lumbar lordosis in bipedal hominins.
Williams (2011): Variation in anthropoid vertebral formulae: Implications for homology and homoplasy in hominoid evolution.

April 9: Forelimb

April 11 & 16: Hip

April 23: Hindlimb
Lovejoy (2005): The natural history of human gait and posture, part 3

April 25: Hands and feet
Midlo (1934): Form of hand and foot in primates.
Napier (1962): The evolution of the hand.
Richmond & Strait (2000): Evidence that humans evolved from a knuckle-walking ancestor.

April 30 & May 7: Reproduction