

University of Colorado, Colorado Springs

Center for Cognitive Archaeology

ANTH 4105/5105: Neurocognition of Art

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Course Description: The course addresses the biological bases of human artistic behavior. The acquaintance of the biological and neurocognitive underpinnings of artistic behavior may largely facilitate the understanding of this otherwise bizarre activity in natural terms, this in turn helping to contextualize art in the frame Natural Selection. The approach provides a suitable basement to face questions on the possible evolutionary origins of art, its development, as well as its major milestones along human evolution. Although the course is mainly focused in visual art, much of its content can be applied to other forms of artistic behavior.

Exams: There are 15 multiple-choice tests, a test for each week. Each question counts equally. The exams comprise all (100%) of the undergraduate grade in the course. For graduate credit, the exams count 75% and a 10–15 page (APA format) term paper, on a pre-approved topic, counts 25%.

Grading Policy, Criteria, and Scale: Your grade will be determined by weekly exams, each of which will cover the primary reading material (15 short online overview lectures) plus additional readings expanding on the week's topic. Your final grade will be determined by the number of points that you receive out of a possible 300 points, noting that the bottom 10% in each category may be awarded a minus, and the top 10% in each category may be awarded a plus:

Topics and Test Due dates

Module	Week	Topic	Points
1 Introduction: Human Nature and Art	1	Exploring the motifs in human art I: Sex, drugs, and animals	20
	2	Exploring the motifs in human art II: The Savannah Hypothesis	20
	3	Art as a source of pleasure: Rewarding systems of the brain involved in visual art	20
2 Perception: Art Appraisal	4	Perceptual mechanisms exploited by art I: Constancy and abstraction	20
	5	Perceptual mechanisms exploited by art II: Visual primitives	20
	6	A comprehensive definition of art: Symbolic, figurative art vs. ornamental, "non-utilitarian" art	20
	7	Art by pre-modern humans	20
	8	Art by non-human primates and other animals. Symbols in non-human primates	20

	9	Perception as part of the puzzle: Visual perception in human and non-human primates	20
3 Action: Motor Aspects of Art	10	Musculoskeletal systems involved in art (I): human vs. non-human primates	20
	11	Musculoskeletal systems involved in art (II): pre-modern vs. modern humans	20
	12	Neural motor control systems involved in art: non-human primates, pre-modern, and modern humans	20
4 Art and the Human Social Brain	13	Embodied human cognition: perception equates action, theory of mind, and mirror neurons	20
	14	Pleasure in own and others' actions: visual art and beyond (dancing and music)	20
	15	Social evolutionary pressures and art	20
TOTAL			300

As an **undergraduate** student, your final grade will be determined by the number of points that you receive out of a possible 300 points on the quizzes:

A	270-300 Points
B	239-269 Points
C	224-338 Points
D	209-223 Points
F	000-208 Points

As a **graduate** student, your final grade will be determined by the number of points that you receive out of a possible 400 (300 points on the quizzes, plus 100 points awarded for the research paper):

A	360-400 Points
B	319-359 Points
C	299-318 Points
D	279-298 Points
F	000-278 Points

Readings

Wk. Readings

1. Hodgson, D., & Helvenston, P.A. (2006) The emergence of the representation of animals in paleoart: Insights from evolution and the cognitive, limbic and visual systems of the human brain. *Rock Art Research*, 23: 3-40.

Lewis-Williams, J.D, Dowson, T.A. (1988). The Signs of All Times: Entoptic Phenomena in Upper Palaeolithic Art. *Current Anthropology*, 29: 201-245.

2. Orians, G.H., and Heerwagen, J.H. (1992) Evolved Responses to Landscapes. In Barkow, J., Cosmides, L., and Tooby, J. (Eds.) *The adapted mind: evolutionary psychology and the generation of culture*. Oxford: Oxford University Press, pp. 555-580

Komar and Melamid's "The Most Wanted Paintings on the Web":
<http://awp.diaart.org/km/>

3. Biederman, I., & Vessel, E. A. (2006). Perceptual Pleasure and the Brain. *American Scientist*, 94: 249-255.

Brown, S., Gao, X., Tisdelle, L., Eickhoff, S.B., and Liotti, M. 2011. Naturalizing aesthetics: Brain areas for aesthetic appraisal across sensory modalities. *NeuroImage* 58: 250-258.

4. Zeki, S. (1999) Art and the brain. *Journal of Consciousness Studies*, 6: 76-96.

Harth, E. (1999). The emergence of art and language in the human brain. *Journal of Consciousness Studies* 6: 97-115.

5. Ramachandran, V.S., & Hirstein, W. (1999). The science of art. A neurological theory of aesthetic experience. *Journal of Consciousness Studies*, 6: 15-51.

Hodgson, D. (2006). Understanding the Origins of Palaeoart: The Neurovisual Resonance Theory and brain functioning. *Paleoanthropology* 2006: 54-67.

6. d'Errico F., Henshilwood C., Vanhaeren M., Van Niekerk K. (2005) Nassarius kraussianus shell beads from Blombos Cave: Evidence for symbolic behaviour in the Middle Stone Age. *Journal of Human Evolution*, vol. 48: 3-24.

Critical reading of the article in Wikipedia about Art (concept, styles, classification, purpose): <http://en.wikipedia.org/wiki/Art>

7. d'Errico, F., and Nowell, A. (2000). A new look at the Berekhat Ram figurine: implications for the origins of symbolism. *Cambridge Archaeological Journal* 10: 123-67.

Kohn, M., and Mithen, S. 1999. Handaxes: products of sexual selection? *Antiquity* 73: 518-526.

8. Premack, D. (1975) Putting a face together. *Science*, 188: 228-290.

Watch these videos:

<http://www.youtube.com/watch?v=asQcyG4QedI>

<http://www.youtube.com/watch?v=oAvJEILFAEQ>

http://www.youtube.com/watch?v=a_PjV8rRgcU

9. Felleman, D.J., and Van Essen D.C. 1991. Distributed hierarchical processing in the primate cerebral cortex. *Cerebral Cortex* 1:1-47.

Grill-Spector K, and Malach, R. (2004). The human visual cortex. *Annual Review of Neuroscience* 27: 649-677

10. Marzke, M.W., and Marzke, R.F. 2000. Evolution of the human hand: approaches to acquiring, analysing and interpreting the anatomical evidence. *Journal of Anatomy* 197: 121-140.

- Diogo, R., Richmond, B.G., and Wood, B. (2012). Evolution and homologies of primate and modern human hand and forearm muscles, with notes on thumb movements and tool use. *Journal of Human Evolution* 63, 64-78.
11. Culley, E.V. 2006. Defining the Biomechanics of Image Production and Neanderthal Capacities for Fully Modern Human Behavior. [Link]:
http://www.academia.edu/445342/Defining_the_Biomechanics_of_Image_Production_and_Neanderthal_Capacities_for_Fully_Modern_Human_Behavior.
- Maki, J., and Trinkaus, E. 2011. Opponens Pollicis mechanical effectiveness in Neandertals and Early Modern Humans. *PaleoAnthropology* 2011: 62-71.
12. Passingham, R. 2008. *What is special about the human brain?* Oxford, Oxford University Press. Chapter 4: *Manual skill*.
- Masri, O.A. 2011. An essay on the human corticospinal tract: History, development, anatomy, and connections. *Neuroanatomy* 10: 1-4.
13. Barsalou, L.W. 2008. Grounded cognition. *Annual Review of Psychology* 59: 617-645.
- Cavallo, A., Becchio, C., Sartori, L., Buccioni, G., and Castiello, U. 2012. Grasping with Tools: Corticospinal Excitability Reflects Observed Hand Movements. *Cerebral Cortex* 22: 710-716.
14. Freedberg, D.; Gallese, V. 2007. Motion, emotion and empathy in esthetic experience. *Trends in Cognitive Sciences* 11: 197-203.
- Van Loon, A.M., Van den Wildenberg, W.P.M., Van Stegeren, A.H., Hajcak, G., and Ridderinkhof, K.R. 2010. Emotional stimuli modulate readiness for action: A transcranial magnetic stimulation study. *Cognitive, Affective, and Behavioral Neuroscience* 10: 174-181.
15. Alexander, R. (2003) Evolutionary selection and the nature of humanity. In V. Hosle & Ch. Illes (Eds) *Darwinism and Philosophy*. University of Notre Dame Press, South Bend, pp. 301-348.
- Zaidel, D.W. 2010. Art and brain: insights from neuropsychology, biology and evolution. *Journal of Anatomy* 216: 177-183.

Extra Credit: Extra credit is not offered in this course.

Graduate Requirements: Graduate students will complete a 10–15 page research paper on a topic approved by the professors by the specified due date.

Due Dates and Deadlines: The syllabus in Blackboard contains the deadline for each unit and specifies the dates by which the test must be completed. For each deadline, you have until 11:59 PM on the deadline day. Remember, these are DEADLINES. You are encouraged to stay well ahead of these deadlines. The sooner you complete the work, the sooner you'll be done with the course.

You must complete each unit by the specific date in the Blackboard version of the syllabus. Once that date has passed, you can still access the material in the unit, but you can no longer take the test associated with that unit. For example, if Unit 3 must be completed by Thursday,

September 16, if you don't take Test 3 by 11:59 PM on September 16, you will receive a 0 for that test.

Prof. Martín-Loeches' Expectations of You: During completion of this course, you must abide by the UCCS Student Conduct Code. This code specifies what is considered proper and improper student conduct, including matters such as cheating and inappropriate behavior. Students who do not abide by the code can receive sanctions ranging up to expulsion from the course or the university.

Remember that this is a 3 credit-hour course. Please plan on spending a lot of time working on just this class. This time will include reviewing lesson plans, completing online lectures, reading from your textbook, answering practice problems, verifying your work, and completing test. We suggest that you plan to spend at least 10 hours per week on average.

Of course, the amount of time spent does not guarantee you any particular grade. Your letter grade will reflect the amount of material that you learned, as reflected in your test scores and the overall quality of your contributions to the course.

Solving Technical Difficulties: When you're having technical difficulties (pages not loading, connectivity problems, not able to view images, things not working as they should, etc.), please contact the Blackboard Helpdesk toll-free at 877.654.8309 or online at the UCCS Blackboard Support page. The Blackboard Helpdesk is available 24 hours a day, 7 days a week. Please note this service is separate from the UCCS IT Helpdesk.

Help Understanding Course Material: When you have questions regarding course policies, grading criteria, test administration, or course content, please email your professor for assistance.