BIOLOGY 345 (10361)
ANIMAL BEHAVIOUR (2016)

Instructor: Dr. T. E. Reimchen, Cunn 056, Ph 721-7101 reimchen@uvic.ca
Lectures: Mon, Thurs 1130-1250, ECS 125

Lab. Coordinator: Dr. R. M. Marx, Petch 105
Ph 721-7089 zoology@uvic.ca
Labs: Petch 110
General outline of lecture topics

The study of behaviour
Behavioural lateralization – left brain vs right brain
Nervous systems among animal phyla: anatomy, receptors, neurotransmitters
Parsing behaviour: genetic, epigenetic, hormonal, environmental, ecoevolutionary
Animal communication, sensory modes and sensory exploitation
Defenses against predators
Optimal foraging, zoopharmacognosy (self-medication)
Habitat choice and territoriality – where and why?
Evolution of sex and mate choice – who and why?
Monogamy/polygyny/polyandry – how often and why?
Parental tactics, brood parasitism, relative investment, infanticide
Self-awareness, consciousness, empathy, animal rights
Sociality, altruism, aggression, conflict and warfare
Evolution of play
Overview: continuity of process
• **Laboratory**
  - Hands-on analyses of simple and complex behaviours across a diversity of taxonomic groups including protists, jellyfish, sea anemones, flatworms, nudibranchs, sea stars, crabs, crayfish and fighting fish.
  - Students will undertake a field project with an option of studying either crows, gulls, squirrels or dogs.
  - There will be an optional field trip to Goldstream Park to observe the chum salmon spawning migration.

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Lab manual
**Biology 345**: Dr. R. M. Marx
~$15
Marking Schedule

Lecture: Midterm (Oct20) (multi-choice) 20%
        Final (TBA) (multi-choice and essay) 35%

Laboratory
        Exercise and pop quizzes 6%
        Tutorials (3@3%) 9%
        Lab exam 10%
        Project 20%

Total lab mks 45%
**General**

**Cheating and Plagiarism**
The University and the Biology Department consider cheating and plagiarism as a serious matter, since ignoring it could be interpreted as endorsing dishonest scholarship. The policy can be found on the online UVic calendar (http://web.uvic.ca/calendar2016-09/undergrad/info/regulations/academic-integrity.html). Please read the policy carefully. In cases of potential dishonesty, the lack of familiarity with this policy is not an excuse. The University of Victoria Biology department reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work.

**Important dates**
On the UVic website you will find a fuller list of important dates, but the ones we have listed below are the ones that will matter to students in Biology 345 and to students wishing to add the course this term.

- **Wednesday, September 7**  First day of classes
- **Monday, September 12**  First day of labs in Biology 345
- **Tuesday, September 20**  Last day for 100% reduction of tuition fees for standard first-term and full-year courses
- **Friday, September 23**  Last day for adding classes
- **Monday, October 10**  Thanksgiving holiday
- **Tuesday, October 11**  Last day for 50% reduction in tuition fees for standard courses
- **Monday, October 31**  Last day of classes dropped after this date
- **Wed-Fri, November 9-11**  Reading break, no classes and no labs
- **Friday, December 2**  Last day of classes
- **Monday, December 5**  First day of final exam period
- **Monday, December 19**  Last day of final exam period

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Topic/author search

Google search for "crow intelligence"

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Joshua Klein: A thought experiment on the intelligence of crows | TED
https://www.ted.com/talks/joshua_klein_on_the_intelligence_of_cro...
Hacker and writer Joshua Klein is fascinated by crows. ... After a long amateur study of crow behavior, he's ...

6 Terrifying Ways Crows Are Way Smarter Than You Think
www.cracked.com/article_19042_6-terrifying-ways-crows-are-way-smarter-than-you... ▼
Feb 28, 2011 - Pretty soon, every single crow on the campus knew which macks meant ... And they totally should: One early test of tool use and intelligence in ...

Crows are as intelligent as CHILDREN: Study reveals birds have ...
www.dailymail.co.uk/.../Crows-intelligent-CHILDREN-Study-reveals-birds-intelligence... ▼
Mar 26, 2014 - Crows are as intelligent as CHILDREN: Study reveals birds are as clever as a seven-year-old human. Crows have a reasoning ability rivaling that of a human seven-year-old, research has shown.

How smart is a crow? - YouTube
https://www.youtube.com/watch?v=URZ_EciujE ▼
Apr 4, 2013 - Uploaded by Mnthesr
This is taken from a wonderful video called "A Murder of Crows" which ... The crow combined what it had ...

Why are crows so smart? | Cosmos
https://cosmosmagazine.com/social-sciences/why-are-crows-so-smart ▼
Mar 10, 2016 - The intelligence of these brainiest of birds has been compared to that of a seven-year-old human. Belinda Smith delves into the behavioural ...

Crow Brains Reveal Secrets of Their Intelligence | IFLScience
Crows are well known for their intelligence. In fact, the entire Corvidae family is renowned for being the smartest of all birds and second only to primates.
The mentality of crows: convergent evolution of intelligence in corvids
NJ Emery, NS Clayton - Science, 2004 - science.sciencemag.org
Abstract Discussions of the evolution of intelligence have focused on monkeys and apes because of their close evolutionary relationship to humans. Other large-brained social animals, such as corvids, also understand their physical and social worlds. Here we ...
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Intelligence in corvids and apes: a case of convergent evolution?
J A Seed, N Emery, N Clayton - Ethology, 2009 - Wiley Online Library
Abstract Intelligence is suggested to have evolved in primates in response to complexities the environment faced by their ancestors. Corvids, a large-brained group of birds, have been suggested to have undergone a convergent evolution of intelligence [Emery & Clayton ( ... Cited by 82 Related articles All 6 versions Cite Save

Evolution of the brain and intelligence
C Roth, U Dicko - Trends in cognitive sciences, 2005 - Elsevier
... Finally, recent reports on high intelligence in animals with relatively small brains, such as birds and dogs ... Using mental and behavioral flexibility as a criterion for intelligence, amo tetrapod vertebrates, mammals and birds appear ... [8]). Among birds, corvids, parrots and Cited by 583 Related articles All 15 versions Cite Save

Social complexity and transitive inference in corvids
AB Bond, AC Kamil, RP Balda - Animal behaviour, 2003 - Elsevier
... Social complexity and transitive inference in corvids. ... Predicting cognitive capacities from individual histories: examples from four corvid species. ... Machiavellian Intelligence: Social Expertise in the Evolution of Intellect in Monkeys, Apes and Humans, Clarendon Press, Oxford (1988 ... Cited by 232 Related articles All 14 versions Cite Save

Social cognition by food-caching corvids. The western scrub-jay natural psychologist
NS Clayton, JM Dally, NJ Emery - ... of the Royal ..., 2007 - rstb.royalsocietypublishing.org
... degree of general intelligence and their relatively large brains with expanded avian prefrontal cortex (nigropallium). In order to do so, we shall begin with a discussion of the general biology of corvids, and what features they share in common with primates. 2. Corvid biology and ...
Basic Search

- corvid intelligence

TIMESPAN

- All years
- From 1900 to 2016

MORE SETTINGS
1. Sexual aggression by intruders in hooded crow *Corvus cornix*
   By: Zduniak, Piotr; Kosicki, Jakub Z.; Yosef, Reuven
   *ACTA ETHOLOGICA* Volume: 19  Issue: 1  Pages: 91-94  Published: FEB 2016

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5. Is primate tool use special? Chimpanzee and New Caledonian crow compared
   By: McGrew, W. C.
   *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES* Volume: 368  Issue: 1630  Article Number: 20120422  Published: NOV 19 2013

6. Abstract rule neurons in the endbrain support intelligent behaviour in corvid songbirds
   By: Veit, Lena; Nieder, Andreas
   *NATURE COMMUNICATIONS* Volume: 4  Article Number: 2878  Published: NOV 2013

7. Tests of inferential reasoning by exclusion in Clark’s nutcrackers (*Nucifraga columbiana*)
2. **Neuronal factors determining high intelligence**

By: Dicke, Ursula; Roth, Gerhard

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B BIOLOGICAL SCIENCES Volume: 371 Issue: 1685 Article Number: 20150180 Published: JAN 5 2016

Within the animal kingdom, complex brains and high intelligence have evolved several to many times independently, e.g. among ecdysozoans in some groups of insects (e.g. blattoid, diptera, hymenopteran taxa), among lophotrochozoans in octopodid molluscs, among vertebrates in teleosts (e.g. cichlids), corvid and psittacid birds, and cetaceans, elephants and primates. High levels of intelligence are invariably bound to multimodal centres such as the mushroom bodies in insects, the vertical lobe in octopodids, the pallium in birds and the cerebral cortex in primates, all of which contain highly ordered associative neuronal networks. The driving forces for high intelligence may vary among the mentioned taxa, e.g. needs for spatial learning and foraging strategies in insects and cephalopods, for social learning in cichlids, instrumental learning and spatial orientation in birds and social as well as instrumental learning in primates.

3. **Convergent evolution of complex brains and high intelligence**

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PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B BIOLOGICAL SCIENCES Volume: 370 Issue: 1684 Article Number: 20150049 Published: DEC 19 2015

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