

**Instructor:** Dr. S.J. Hecnar

**Lectures:** 11:30 am – 1:00 pm Tues. & Thurs., AT 1005.

**Laboratory:** Friday 2:30-5:30 pm, CB 3013

**Office hours:** 1:00 – 1:30 pm Mon., Tues., Wed., & Thurs.

**Email:** shecnar@lakeheadu.ca

**Website:** <http://flash.lakeheadu.ca/~shecnar/> (Course info and news also available on website)

**Lab Technician:** D.R. Hecnar

**Teaching Assistant:** TBA

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**Res. Lab:** CB 3021

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**Course Description:** Origin, structure, life history, distribution, ecology and conservation of amphibians and reptiles. A survey of living families. Special attention is focused on species occurring in Canada, particularly those in Ontario.

**Lecture Materials:** A Desire2Learn site has been set up for this course. Lectures can be downloaded as PowerPoint files from the D2L site gratis. These files and all of their contents are for personal study purposes only and not for copying or distribution to others.

#### **Required Textbooks:**

1) Pough, F.H., R.M. Andrews, M.L. Crump, A.H. Savitzsky, K.D. Wells, and M.C. Brandley. 2015. Herpetology, 4<sup>th</sup> edition. Sinauer Associates, Sunderland, MS. 591 + 128 pp. ISBN: 978-1-60535-233-6

2) Conant, R., and J.T. Collins. 1998. A Field Guide to Reptiles and Amphibians: Eastern and Central North America. 3<sup>rd</sup> edition. Houghton Mifflin Company, Boston. 616 pp. ISBN 0-395-90452-8

3) Powell, R., J.T. Collins, and E.D. Hooper, Jr. 2012. A Key to the Herpetofauna of the Continental United States and Canada. 2<sup>nd</sup> Edition. University Press of Kansas, Lawrence KS. 66049. 160 pp. ISBN 978-0-7006-1833-0

**Other Required Materials:** The lab manual is available for download gratis on the Desire2Learn site for the course. Audio tapes and CDs of frog calls are available for loan from the technician. A small deposit is required and will be refunded upon return if the media is undamaged. Students should have their own dissecting kit, safety glasses and rubber gloves or may rent/purchase these from the Biology technicians. Proper attire (e.g. rubber boots) should be worn for field trips.

#### **Optional Resource Materials:**

Vitt, L.J., and J.P. Caldwell. 2014. Herpetology: An Introductory Biology of Amphibians and Reptiles, 4<sup>th</sup> edition. Academic Press, San Diego. 734 pp. ISBN: 978-0-12-386919-7 or earlier edition

Zug, G.R., L.J. Vitt, J.P. Caldwell. 2001. Herpetology: An Introductory Biology of Amphibians and Reptiles, 2<sup>nd</sup> edition. Academic Press, San Diego. 630 pp. ISBN 0-12-782622-X . *A used copy of the previous edition of the text will suffice.*

Pough, F.H., R.M. Andrews, J.E. Cadle, M.L. Crump, A.H. Savitsky, and K.D. Wells. 2004. Herpetology, 3<sup>rd</sup> edition. Prentice Hall, Upper Saddle River, NJ. 07458. 612 pp. ISBN 0-13-100849-8 *Earlier edition to current textbook.*

Harding, J.H. 1997. Amphibians and Reptiles of the Great Lakes Region. University of Michigan Press, Ann Arbor. 378 pp. ISBN 0472066285. *A good field guide with detailed natural history information on species occurring in the Great Lakes Basin.*

MacCulloch, R.D. 2002. The ROM Field Guide to Amphibians and Reptiles of Ontario. McClelland & Stewart Ltd, Toronto. 168 pp. ISBN 0771076517. *A good compact fieldguide with excellent photographs covering Ontario species.*

Powell, R., J.T. Collins, and E.D. Hooper, Jr. 1998. A Key to Amphibians and Reptiles of the Continental United States and Canada. University Press of Kansas, Lawrence KS. 66049. 131 pp. ISBN 0-7006-0929-6 *A used copy of the last edition of the lab key can be used in place of the latest edition.*

Elliott, L. 1997. The Calls of Frogs and Toads. NatureSound Studio, Ithaca, NY  
<<http://www.naturesound.com/frogs/frogs.html>> *An excellent CD of North American frog calls accompanied by a booklet.*

Elliot, L., C. Gerhardt, and C. Davidson. 2009. The Frogs and Toads of North America. *A good guide to North American species with excellent photos, brief accounts, and it contains a CD of calls.*

**Marking Scheme:** Midterm 25%, Lab 35%, Final Exam 40%

**Examination Dates:** Midterm Tuesday, October 27<sup>th</sup>., Lab Exam: Friday, November 27<sup>th</sup>.

Examination format - Combination of any or all of the following: fill in the blanks, true or false, multiple choice, definitions, short answers, essays, labeling, drawing.

Lab Mark - Consists of lab examination, quizzes, short assignments.

**Reserve Material/Literature Assignment:** We have been steadily adding to the Paterson Library holdings in herpetology each year depending upon budget. The library now subscribes to several electronic herpetological journals. Supplemental reading material in the form of primary literature may be provided for your use on reserve or on D2L. Topics of papers will be chosen to complement or augment lecture topics. These papers will be available for download on D2L or held in a folder at the circulation desk of the library for loan/copying. **Each student must provide evidence that they have read and comprehend at least five papers** from the reserve collection. Alternatively, if a student has a special interest in herpetology, they may select other papers in herpetology in lieu of the reserve collection. Many papers can be found and downloaded by doing a topic keyword search on Google Scholar. A report consisting of a one page summary and review for each paper read **must be handed in on the last lab, November 20th**. This report will not be used in calculating the final mark but must be satisfactorily completed in order for a final mark to be forwarded to the registrar's office. **A grade of 'Incomplete' will be submitted if the report is not received or if it is unsatisfactory.**

**Herpetology on the World Wide Web:** There are many websites dealing with various aspects of herpetology. As with any web-based sites the quality of information varies. Good information can generally be found on academic, government, official non-governmental organization, and herpetological

society web pages. Here are a few useful resources....

<<http://www.npwrc.usgs.gov/narcam/idguide/specieid.htm>> U.S.G.S. amphibian site - identification, photos, & distribution of North American species.

<<http://amphibiaweb.org/>> Amphibia Web - U.C. Berkeley project offering information on all species of amphibians.

<<http://www.reptile-database.org/>> EMBL database on reptiles of the world.

<<http://www.naturewatch.ca/cgi-bin/quiz/step1.asp>> The Great Canadian Amphibian and Reptile Quiz - a good interactive test of your knowledge of identifying Canadian species by photographs or calls.

<<http://www.canadianherpetology.ca/>> Canadian Herpetological Society - Canada's working group website offer information on Canadian herpetological issues.

<<http://www.carcnet.ca/>> Canadian Amphibian and Reptile Conservation Network - older working group website which is being migrated to the CHS website.

<<http://www4.uwm.edu/fieldstation/herpetology/atlas.html>> Wisconsin Herpetological Webpage - an excellent site offering information on many species that also occur in Ontario. Links to state DNR herp pages.

<<http://www.ssarherps.org/>> The Society for the Study of Amphibians and Reptiles which publishes the *Journal of Herpetology* and *Herpetological Review*.

<<http://www.herplit.com/herplit/>> A searchable database of herpetological papers which includes many abstracts.

<<http://nhic.mnr.gov.on.ca/MNR/nhic/herps/ohs.html>> Ontario Herpetofaunal Summary Atlas - range maps of all Ontario species.

<[http://www.ontarionature.org/protect/species/herpetofaunal\\_atlas.php](http://www.ontarionature.org/protect/species/herpetofaunal_atlas.php)> Ontario Nature's Herpetofaunal Atlas which now supercedes the OHS atlas noted above. The site contains details on how to report observations for inclusion in the atlas.

<<http://www.cnah.org/>> Centre for North American Herpetology - a good source of information and links. The site also has a library of herpetological papers in pdf format that can be downloaded gratis.

<<http://www.herpconbio.org/>> Herpetological Conservation and Biology - the first online professional journal of herpetology. Papers can be downloaded as pdfs gratis.

**Other Information:** In this course we will be covering a lot of material. An advantage of an 'ology' course is that it concerns the entire biology of a taxonomic group, in this case two or three vertebrate classes: Amphibia, Reptilia, and Chelonia. Appropriately, as a final year undergraduate course we will delve into many aspects of biology to provide a synthesis of the biological knowledge of these ectothermic tetrapods. In this way, Herpetology can act as a capstone course. Although there are no specific

prerequisites beyond first year biology, being a senior course, I assume that students understand basic biological, ecological, and evolutionary principles. Space may be limited so preference in registration may be given to senior biology majors or by special permission of the instructor. Maintaining good attendance is for your own benefit. Examination questions often come from poorly attended lectures. Noise or distractions will not be tolerated. Please have cellular phones turned off during lectures and labs. With good attendance and study the student will leave this course with a good knowledge of herpetology and Ontario's herpetofauna.

## **Biology 4435 Herpetology - Tentative Schedule of Topics**

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### **Lecture Topics**

1. Introduction
2. Differences & Similarities Between Amphibians & Reptiles
3. Origin & Evolution of Tetrapoda: Amphibians
4. Origin & Evolution of Tetrapods: Reptiles
5. Phylogeny & Systematics
6. Classification of Extant Amphibians - Caecilians
7. Classification of Extant Amphibians - Salamanders
8. Classification of Extant Amphibians - Anurans
9. Classification of Extant Reptiles - Turtles, Tortoises & Sphenodonts
10. Classification of Extant Reptiles - Lizards & Snakes
11. Classification of Extant Reptiles - Crocodilians
12. Survey of Ontario Amphibians
13. Survey of Ontario Reptiles

### **Midterm Exam Tuesday, October 27<sup>th</sup> 2015**

14. Temperature & Water Relations
15. Energetics: Gas Exchange
16. Energetics: Metabolism & Performance
17. Reproduction & Genetics
18. Life Cycles & Life History
19. Feeding
20. Body Structure & Locomotion
21. Movements & Orientation
22. Communication
23. Ecology: Biotic & Abiotic Interactions
24. Ecology: Species Assemblages
25. Ecology: Spatial & Temporal Dynamics
26. Biogeography
27. Human Exploitation
28. Conservation: Amphibians
29. Conservation: Reptiles
30. T.B.A.

### **Lab**

1. Introduction to Herpetology
2. Diversity of Amphibians
3. Diversity of Reptiles

4. Diversity of the Ontario Herpetofauna
  5. Frog & Toad Calls
  6. Structure of Anurans
  7. Structure of Caudata
  8. Structure of Squamates
  9. Structure of Testudines
  10. Field Methods and Equipment
  11. Ecological Data Analysis
  12. Review for Lab Exam (**Literature Assignment due November 20<sup>th</sup>, 2015**)
  13. **Lab Exam (comprehensive) Friday November 27<sup>th</sup>, 2015**
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