

## Biodiversity & Biogeography ([EESC04H3F](#)) - 2014

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<b>Course Instructor:</b>	<b>Sandy M Smith</b> ( <a href="mailto:s.smith.a@utoronto.ca">s.smith.a@utoronto.ca</a> ), Professor, Faculty of Forestry Earth Sciences Building, St George Campus Rm 2011, Phone 416-978-5482
<b>Office Hours:</b>	Before Class or by Appointment (email request)
<b>Lab Technicians:</b>	<b>Chai Chen</b> , Email: <a href="mailto:chen@utsc.utoronto.ca">chen@utsc.utoronto.ca</a> Rm PO 103-#122, Phone: 416-287-7324 <b>Tom Meulendyk</b> , Email: <a href="mailto:tmeulendyk@utsc.utoronto.ca">tmeulendyk@utsc.utoronto.ca</a>
<b>Teaching Assistants:</b>	<b>Felicity Ni</b> Email: <a href="mailto:felicity.ni@utoronto.ca">felicity.ni@utoronto.ca</a> <b>Carlos Arnillas</b> Email: <a href="mailto:carlosalberto.arnillas@gmail.com">carlosalberto.arnillas@gmail.com</a>
<b>Lecture Schedule:</b>	Fall Tuesdays; 5-7pm, Management Wing (MW), Rm 120
<b>Lab Schedule:</b>	Wednesdays; 11am-1:30pm and 2-4:30pm All Labs, Science Wing, Rm 313
<b>Course Website:</b>	Blackboard
<b>Course Reading:</b>	<b><i>Recommended (not required) Text:</i></b> Biogeography: An Ecological and Evolutionary Approach 2010, (8 <sup>th</sup> edition), C. Barry Cox & Peter D. Moore

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### **Course Description:**

Biogeography is the study of the geographic distribution of species while biodiversity is the study of species richness and relative species abundance. This 2-hour lecture and 2.5-hour lab course explores the origin, maintenance, and loss of biodiversity from a biogeographic perspective.

The course addresses the theoretical and practical aspects of organismal diversity in terms of functional and geographic distribution. It will familiarize students with the diversity of animal life and species distributions, with emphasis on invertebrate animals, as this group represents the vast majority of structural and functional biodiversity on the planet today. Information on important animal groups and their evolution will be set in the context of past and present global patterns.

The course begins with the evolution of diversity in terms of form and function covering topics on the major biomes (marine and terrestrial), continental drift, dispersal, endemism, concepts of abundance and rarity, comparison of biota on continents and islands, and the

fundamental influence of climate. Important biological processes include adaptation, speciation, colonization and extinction. The course concludes with discussion of the invasive role of humans in shaping modern biogeography.

The course aims to provide students with a broader understanding of what constitutes biodiversity, how it has come to be, and what geographic factors help explain and drive the patterns observed today.

**Course Evaluation:**

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<b>Assignment</b>	<b>Due Date</b>	<b>Mark</b>
<b>Midterm Exam</b> <i>(lecture &amp; labs to Midterm)</i>	<b>21 October 2014</b> <i>(In Class – Multiple Choice)</i>	20%
<b>Lab Report 1</b>	<b>8 October 2014</b>	20%
<b>Lab Report 2 &amp; Group Presentation</b>	<b>26 November 2014</b>	15%+2%
<b>4 Lab Summary Outlines</b>	<b>1, 8, 22 &amp; 29 October 2014</b> <i>(2% each week)</i>	8%
<b>Final Exam</b> <i>(All lecture &amp; lab material)</i>	<b>December Exam Period</b> <i>(Short &amp; Long Answer Format)</i>	35%
<b>TOTAL</b>		<b>100%</b>

**Note:** \*\*All assignments are due on the date specified. Extensions or delays must be supported with a medical certificate. Late assignments will be penalized 2% per week day up to a maximum of 40% of the assignment value unless discussed with the Professor or TA first.

### Academic Integrity:

The **University of Toronto's Academic Integrity Handbook** defines academic integrity as "... one of the cornerstones of the University of Toronto". The University of Toronto's Code of Behaviour on Academic Matters, which all students are expected to know and respect, says it is an offence for students to:

- To use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, *i.e.* to commit plagiarism.
- To include false, misleading or concocted citations in their work.
- To obtain unauthorized assistance on any assignment.
- To provide unauthorized assistance to another student. This includes showing another student completed work.
- To submit their own work for credit in more than one course.
- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam.

***THUS...Plagiarism is unacceptable and will be penalized according to University of Toronto policy (see <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>).***  
*Assistance to avoid plagiarism: <http://homes.chass.utoronto.ca/~nscharer/plagmain.htm>*

### Grading Standards:

Percentage	Letter Grade	Grade Definition	
90-100	A+	Excellent	Strong evidence of original thinking; good organization; capacity to analyze and synthesize; superior grasp of subject matter with sound critical evaluations; evidence of extensive knowledge base.
85-89	A		
80-84	A-		
77-79	B+	Good	Evidence of grasp of subject matter, some evidence of capacity and analytic ability; reasonable understanding of relevant issues; evidence of familiarity with literature.
73-76	B		
70-72	B-		
67-69	C+	Adequate	Student who is profiting from his/her university experience; understanding of the subject matter; ability to develop solutions to simple problems in the material.
63-66	C		
60-62	C-		
57-59	D+	Marginal	Some evidence of familiarity with subject and some evidence of critical and analytic skills have been developed.
53-56	D		
50-52	D-		

## Lecture/Discussion Topics

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<b>Lecture</b>	<b>Date</b>	<b>Topic</b>
1	2 Sept	Making sense of diversity: Intro to classification
2	9 Sept	Describing & measuring diversity
3	16 Sept	Spatial-temporal diversity: Limits & driving forces
4	23 Sept	Changing geography - Drifting continents, climate
5	30 Sept	Animal diversity & evolution
6	7 Oct	Dispersal; Biological realms past & present patterns <i>Guest Lecture – Forest Conservation (J. Malcolm 5-6pm)</i>
	<b>14 Oct</b>	<b>READING WEEK - NO CLASS</b>
7	21 Oct	<b><i>Mid-Term Test (20%) - @ 5:00 pm in class</i></b>
8	28 Oct	Tools & approaches in biogeography: Major biomes
9	4 Nov	Speciation, extinction & dispersal <i>Guest Lecture – Climate Change (Sean Thomas 6-7pm)</i>
10	11 Nov	Geography of genes & chromosomes The life & death of species
11	18 Nov	Humans & the shaping of modern biogeography
12	25 Nov	Biogeography of the future

***FINAL EXAM (35%) Scheduled in Exam Period***

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## Lab Schedule

<b>Lab</b>	<b>Date</b>	<b>Topic</b>
1	3 Sept	Describing & measuring biodiversity <b>Field Work:</b> Assessing local faunal diversity ( <b>LAB REPORT 1 due 8 October</b> )
2	10 Sept	<b>Field Work (continued):</b> Assessing local faunal diversity ( <i>continued</i> )
3	17 Sept	Lab work on local diversity; Identification, tabulation & indices ( <i>continued</i> )
4	24 Sept	Lab work on local diversity; Report preparation & open support ( <i>continued</i> )
5	1 Oct	Classification and phylogeny: Phylum Metallica <b>(Exercise due end of Lab – 2%)</b>
6	8 Oct	**Diversity blueprint: From single cell to primitive eukaryotes & radiates ( <i>Protozoa, Porifera, Cnidaria</i> ) <b>(Summary - 2%)**</b> <b>(LAB REPORT 1 due – 20%)</b>
	15 Oct	<b>READING WEEK - NO LABS</b>
7	22 Oct	**Diversity blueprint: The Bilaterate flatworms & invertebrates ( <i>Platyhelminthes, Mollusca, Arthropoda</i> ) <b>(Summary - 2%)**</b>
8	29 Oct	**Diversity blueprint: Chordates, vertebrate development & distribution ( <i>Echinodermata, Chordata</i> ) <b>(Summary - 2%)**</b>
9	5 Nov	Biogeography & conservation of endangered species <b>(LAB REPORT 2 &amp; PRESENTATION due 26 November)</b>
10	12 Nov	Biogeography & conservation of endangered species ( <i>continued</i> )
11	19 Nov	Biogeography & conservation of endangered species ( <i>continued</i> )
12	26 Nov	Final biogeography & conservation of endangered species <b>(LAB REPORT 2 (15%) &amp; GROUP PRESENTATION (2%) due)</b>

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**\*\* Need to write summary report for each of three biodiversity labs; see note below (worth 2% each)**

Come to each of the three biodiversity labs (8, 22 and 29 October) prepared with a single-spaced, 3-page (max!) Summary Outline addressing the groups to be studied that day, and using the Headings listed below. This will ensure that you are prepared to examine living and preserved specimens in the labs and to understand the relationship of each group within the Earth's biodiversity.

Your Summary Outline must be handed in to the TA at the end of each lab period. They will mark the Outline (2% per Outline) and return them to you the following week. This will ensure that you have studied some background material available on each group and can come prepared to answer questions about this material on both the Midterm and Final Exams.

As a minimum, one paragraph is required under each of the following Headings in the Summary Outline for each of the three labs:

1. Taxonomy/Phylogenetic Relationship (tree)
2. Evolutionary Origins & Geography (temporal & spatial)
3. Ecology/Environmental Requirements (general pattern)
4. Typical Body Plan (image)
5. Three Example Species (use lab material)

### **Some Useful Websites for Sourcing Information:**

#### **Kingdom Protozoa:**

<http://en.wikipedia.org/wiki/Protozoa>

#### **Eumetazoa:**

<http://en.wikipedia.org/wiki/Eumetazoa>

#### **Kingdom Animalia:**

<http://en.wikipedia.org/wiki/Animal>

#### **Tree of Life Web Project:**

<http://tolweb.org/tree/phylogeny.html>

#### **Timeline of Natural History:**

[http://en.wikipedia.org/wiki/Timeline\\_of\\_natural\\_history](http://en.wikipedia.org/wiki/Timeline_of_natural_history)

#### **Encyclopedia of Life:**

<http://eol.org/pages/4651/overview>