

# EEB266

## Animal Diversity: Invertebrates

### Course Instructor

Dr. Danielle de Carle

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<b>Lectures</b>	Fridays	10:00 – 12:00	SS 1086
<b>Labs</b>	Wednesdays	14:00 – 17:00	RW 013

### Course Description

The diversity of invertebrates (e.g. sponges, jellyfish, flatworms, molluscs, segmented worms, round worms, arthropods, echinoderms and several smaller phyla) is explored, focusing on taxonomic characters that define each group, their placement in the evolutionary tree of life, as well as their ecological function, biological requirements, and geographic distributions. Major questions in the evolutionary relationships of animals are explored. Labs emphasize identification and recognition of major groups.

### Learning Outcomes

- Understand the diversity of invertebrate animals, their evolutionary relationships, and ways of life
- Understand the relationships between animal phyla
- By observing museum specimens, learn to make inferences about organisms and their ecology
- Practice formulating hypotheses about organisms and how they change over evolutionary time

### Recommended Text

Brusca, R.C., Moore, W., Shuster, S.M., 2016. *Invertebrates*, 3rd ed. Sinauer Associates Inc., Sunderland, MA.

### Evaluation

Lab quizzes	14%
Mid-term exam	30%
Presentations (see below)	16%
Final exam	35%
Participation	5%

**Participation grades** will be based on attendance and active engagement with the course material (e.g. during labs and presentations/question periods, on Quercus, etc.)

Date		Topic
Sept. 9 <sup>th</sup>	Lecture 1	Introduction to Metazoa: Porifera
Sept. 16 <sup>th</sup>	Lecture 2	What is the Sister to the Remaining Metazoa?: Cnidaria, Ctenophora, Placozoa
Sept. 21 <sup>st</sup>	LAB 1	Porifera, Ctenophora, Cnidaria
Sept. 23 <sup>rd</sup>	Lecture 3	Adaptations to Parasitism: Platyhelminthes
Sept. 28 <sup>th</sup>	LAB 2	Platyhelminthes <i>Lab Quiz 1</i>
Sept. 30 <sup>th</sup>	Lecture 4	(Most of) The Coolest Worms: Nemertea & Annelida
Oct. 5 <sup>th</sup>	LAB 3	Nemertea & Annelida <i>Lab Quiz 2</i>
Oct. 7 <sup>th</sup>	Lecture 5	Evolution of Armour: Mollusca, Lophophorata
Oct. 12 <sup>th</sup>	LAB 4	Mollusca, Brachiopoda <i>Lab Quiz 3</i>
Oct. 14 <sup>th</sup>	Lecture 6	Introduction to Ecdysozoa: Nematoida, Scalidophora & Gnathifera; <b><i>Deadline to choose presentation groups</i></b>
Oct. 19 <sup>th</sup>	LAB 5	Scalidophora, Nematoida, Rotifera <i>Lab Quiz 4</i>
Oct. 21 <sup>st</sup>	Lecture 7	Panarthropoda I: Tardigrada, Onychophora, Myriapoda, Crustacea & the Modular Arthropod Body Plan
Oct. 26 <sup>th</sup>	<b>MIDTERM EXAM</b>	
Oct. 28 <sup>th</sup>	Lecture 8	Panarthropoda II: Hexapoda, Chelicerata & the Arthropod Fossil Record
Nov. 2 <sup>nd</sup>	LAB 6	Panarthropoda <i>Lab Quiz 5</i>
Nov. 4 <sup>th</sup>	Lecture 9	Ambulacraria: Hemichordata & Echinodermata
Nov. 16 <sup>th</sup>	LAB 7	Ambulacraria <i>Lab Quiz 6</i>
Nov. 18 <sup>th</sup>	Lecture 10	Chordata (but not vertebrates)
Nov. 23 <sup>rd</sup>	LAB 8	Group presentations I <i>Lab Quiz 7</i>
Nov. 25 <sup>th</sup>	Lecture 11	Outstanding Questions in Invertebrate Systematics: Xenacoelomorpha & the Deuterostome Situation
Nov. 30 <sup>th</sup>	LAB 9	Group presentations II
Dec. 2 <sup>nd</sup>	Lecture 12	TBD
Dec. 7 <sup>th</sup>	<i>No lab</i>	

## Presentations

For this project, you and your group will deliver a fifteen-minute presentation on one of the topics below. As research for your presentation, you are expected to cite at least three, peer-reviewed papers. (You will find that review papers are probably most helpful for this purpose.) Each presentation will be followed by a five-minute question period, during which you are expected to participate actively, both as a presenter and as an audience member. More detailed information is provided in the assignment rubric.

Your group will need to **choose one of the topics provided**. Each topic includes a brief introductory blurb, as well as a section, that outlines the **minimum requirements** for your presentation. You are expected to **elaborate on these topics, and synthesize information in a meaningful way**. Wherever possible, talk about any **trends or patterns you may notice across phyla**.

## Course Policies

### COVID-19 Safety

Do not come to class if you, or someone you have been in close contact with, are experiencing any symptoms of COVID-19. Lecture recordings can be made available, provided you **contact the instructor before class begins**.

***Masks are strongly recommended, especially for lab sections.***

### Equity, Diversity, and Inclusion

The EEB Department at the University of Toronto acknowledges the historical and ongoing exclusion of, and discrimination against, marginalized groups from the fields of ecology and evolutionary biology, as well as science and academia more broadly. By participating in this class, you commit to conducting yourself in a respectful, inclusive, and professional manner.

More information, including the Department's Code of Conduct and Statement of Values, can be found here: <https://eeb.utoronto.ca/equity-diversity-inclusion/>

### Email

Messages will be answered within three business days. All emails must include the course code (EEB266) in the subject line. Students are also encouraged to use the Quercus message boards for questions about course content.

### Accessibility and Accommodations

Students with diverse learning styles and needs are welcome in this course. If you require accommodations, or have any accessibility concerns regarding the course, the classroom, or course materials, please feel free to approach the course instructor and/or the Accessibility Services office ([www.accessibility.utoronto.ca](http://www.accessibility.utoronto.ca)).

## Audio and Video Recordings

Please **do not make audio or video recordings** of any course content. All lecture and lab materials, including audio recordings are strictly for personal use by students enrolled in EEB266. **Distributing, transmitting, reproducing, or re-posting any course material – in whole or in part – is strictly prohibited without explicit, written permission of the course instructor. Doing so constitutes a violation of intellectual property rights and the Canadian Copyright Act.**

## Missing a Test or Quiz

Students who have a legitimate reason for missing a lab quiz or exam must inform the course instructor **within 24 hours** of the test. For exams, students must also provide adequate documentation (*i.e.* a written statement from a medical professional – in the event of an illness – or from their college registrar – in the event of a personal or family crisis).

## Academic Integrity

Academic integrity is essential to the pursuit of learning and scholarship at the University of Toronto, and ensures that the degree you earn will be a strong signal of your individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously.

Students are expected to familiarize themselves, and act in accordance, with the University of Toronto's Code of Behaviour on Academic Matters ([www.academicintegrity.utoronto.ca](http://www.academicintegrity.utoronto.ca)). Potential offences include, but are not limited to:

- Using someone else's ideas or words without appropriate acknowledgement.
- Making up sources or facts
- Obtaining or providing unauthorized assistance on any assignment
- Using or possessing unauthorized aids
- Looking at someone else's answers during an exam or test
- Misrepresenting your identity
- Falsifying institutional documents or grades
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes