UNIVERSITY OF SASKATCHEWAN
Department of Biology

COURSE SYLLABUS

COURSE TITLE:	**PBIO 230 On the Origin and Life of Animals**		
COURSE CODE:	27320	TERM:	Winter term 2022
COURSE CREDITS:	3.0	DELIVERY:	3L/4P
CLASS SECTION: LECTURE LOCATION: LECTURE TIME: WEBSITE:	01 Geol 265 T/Th 10:00 – 11:20 via PAWS/Canvas	START DATE: LAB LOCATION: LAB TIME:	Jan 6 2022 (lectures) Jan 10 2022 (labs) Thorv G11 Mondays 1:30 to 5:20 pm

Course Description

This course will examine the evolutionary origin, structure-function and ecological relationships of animals, with an emphasis on the major invertebrate groups.
Prerequisite(s): BIOL 120 and one of BIOL 121 or GEOL 122

Course Themes

This course will be taught using the following themes:

1. the biodiversity of modern invertebrate groups in relation to their evolution;
2. morphology to illuminate the diversity of invertebrate animals;
3. the role of invertebrates in ecosystems;
4. application of knowledge about invertebrates, including in human and animal health

Learning Outcomes

On successful completion of this course, students will have demonstrated their ability to

1. explain the origins of animals and invertebrate groups using an evolutionary framework
2. recall the morphological characteristics of the major groups of invertebrates
3. relate specific examples of invertebrate impacts on human and animal health and the environment;
4. explain important adaptations of invertebrates to their environment;
5. examine a variety of animal specimens and examples to acquire knowledge;
6. interpret contemporary research articles from journals about invertebrate zoology;
7. illustrate their acquired knowledge in visual and written form;
8. work competently and efficiently with other students and the course instructors.

Note: The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in

realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: https://teaching.usask.ca/about/policies/learning-charter.php

More information on University policies on course delivery, examinations and assessment of student learning can be found at: http://policies.usask.ca/policies/academic-affairs/academic-courses.php

Land & Treaty Acknowledgement

As we gather here today, we acknowledge that the Saskatoon campus of the University of Saskatchewan is on Treaty Six Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. We recognize that in the course of your studies you will spend time learning in other traditional territories and Métis homelands. We wish you safe, productive and respectful encounters in these places.

Course Overview

The course consists of 3 hours of face-to-face lectures on the T/Th schedule and a 4-hour lab each week. Generally-speaking, the laboratory exercises are designed to illustrate specific aspects relating to the morphology, evolutionary and/or ecology of an invertebrate group. The lectures will tend emphasize broader evolutionary and ecological relationships or concepts relating to the various lifestyles of each invertebrate group.

The course is specifically designed so that the laboratory exercise for an invertebrate group occurs before the lectures about that group have commenced. The intent of this “reversed” lecture and lab is to have you learn substantial details about an invertebrate group before coming to the lecture. The lecture can then focus on more general and integrative aspects, allowing for more interaction between the instructor and students. The teaching methods have been designed to facilitate the development of a strong knowledge base in animal origins and invertebrate biology. Course content will be explored in a way that explains difficult concepts and encourages students’ participation in the learning process.

Attendance at the laboratories is required. These practical sessions provide learning activities that are essential to the achievement of the learning outcomes of the course. New content is covered in these laboratories and more skills and competencies will be acquired. Students will be responsible for some advanced reading prior to attending each laboratory session and for seeking new knowledge during the lab period. Overall, the laboratory exercises will allow students to develop their skills at identifying and describing animals, as well as searching and interpreting the scientific literature in invertebrate biology.

Students will be placed in groups of three or four, and each group will be assigned a Group Homepage on Canvas where they can share information and work together. However, the lab exercises require that each student complete all the activities outlined in the lab manual. We have designed these activities to maximize the individual learning that is needed for the lab quizzes and course exams. We anticipate that each lab exercise will require the full four hours to complete with some additional time (one to two hours) spent as preparation time in advance of each lab.

Detailed Course Schedule

Week Lecture Instructor	Laboratory Activity	Major Lecture Topics
Week 1 Marchant & Mángano	No Lab This Week	Thursday January 6 • Introduction to the course • Review of the Tree of Life • Introduction to Ancient Life Readings: Textbook Chapters 1 & 28 (portions); Canvas materials
Week 2 Mángano	Monday January 10 Lab #1 The Ediacaran & Cambrian Animals Readings: Lab manual & Canvas materials	T/Th January 11 & 13 The Ediacaran origin of animals Readings: Canvas materials
Week 3 Mángano	Monday January 17 Lab #2 Choanoflagellates & Poriferans Readings: Lab manual and textbook Chapters 3 & 6.	T/Th January 18 & 20 The Cambrian explosion and origin of modern animal phyla Readings: Canvas materials
Week 4 Marchant	Monday January 24 Lab #3 Cnidarians Readings: Lab manual and textbook Chapter 7.	T/Th January 25 & 27 The Life of Choanoflagellates & Poriferans Readings: Textbook Chapters 3 and 6; Canvas materials
Week 5 Marchant	Monday January 31 Lab #4 The Spiralia - Part A Platyhelminthes Readings: Lab manual and textbook Chapter 10.	T/Th February 1 & 3 The Life of Cnidarians Readings: Textbook Chapters 7 and 8; Canvas materials

Week Lecture Instructor	Laboratory Activity	Major Lecture Topics
Week 6 Marchant	Monday February 7 *Learning Assessment 8%:* First Lab Quiz (30 minutes at start of lab period; covers Labs 1 to 3) Lab #5 The Spiralia - Part B Annelida Readings: Lab manual and textbook Chapter 14.	T/Th February 8 & 10 Introduction to Bilateria, Protostomes & Deuterostomes The Spiralia: The Life of Platyhelminthes Readings: Textbook Chapters 9 and 10; Canvas material
Week 7 Chilton **Note:** *Midterm exam held Tuesday Feb 15 at 5:30 pm room TBA*	Monday February 14 Lab #6 The Spiralia - Part C Mollusca (Bivalvia) Readings: Lab manual and textbook Chapter 13.	T/Th February 15 & 17 The Spiralia: The Life of Annelida Readings: Textbook Chapters 13 and 14; Canvas material
Feb 21-25	Midterm Break – no Lab	Midterm Break – no Lectures
Week 8 Chilton	Monday February 28 Lab #7 The Spiralia - Part D Mollusca (Cephlapoda) Readings: Lab manual and textbook Chapter 13.	T/Th March 1 & 3 The Spiralia: The Life of Mollusca Readings: Textbook Chapter 13; Canvas material
Week 9 Chilton	Monday March 7 *Learning Assessment 12%* Second Lab Quiz (30 minutes at start of lab period; covers Labs 4 to 7) Lab #8 The Ecdysozoa – Part A Chelicerata & Myriapoda Readings: Lab manual and textbook Chapters 23 & 24.	T/Th March 8 & 10 The Ecdysozoa: The Life of Nematoda The Arthropoda: The Life of Myriapoda Readings: Textbook Chapters 18, 20 and 23; Canvas material

Week Lecture Instructor	Laboratory Activity	Major Lecture Topics
Week 10 Chilton	Monday March 14 Lab #9 The Ecdysozoa – Part B Crustacea Readings: Lab manual and textbook Chapter 21.	T/Th March 15 & 17 The Arthropoda: The Life of Chelicerata The Arthropoda: The Life of Crustacea Readings: Textbook Chapters 21 and 24; Canvas material
Week 11 Chilton	Monday March 21 Lab #10 The Ecdysozoa – Part C Hexapoda Readings: Lab manual and textbook Chapter 22.	T/Th March 22 & 24 The Arthropoda: The Life of Hexapoda Readings: Textbook Chapter 22; Canvas material
Week 12 Marchant	Monday March 28 Lab #11 The Deuterostomia Echinoderms Readings: Lab manual and textbook Chapters 25	T/Th March 29 & 31 The Deuterostomia The Life of Ambulacraria Readings: Textbook Chapters 25 & 26; Canvas material
Week 13 Mángano	Monday April 4 *Learning Assessment 20%* Final Lab Quiz (60 min during lab period, comprehensive)	Tuesday April 5 A macroevolutionary perspective: follow-up of the Cambrian explosion and construction of the modern marine ecosystem. Readings: Textbook Chapter 28; Canvas material
		Learning Assessment (40%) Final Examination during regular exam period. Note that the exam period this year runs from April 7 to 28.

Instructors:

Contact Information:

Dr. Tracy Marchant (Course Coordinator)	306-966-4420 rm 120.3 CSRB	Use Canvas messages
Dr. Gabriela Mángano	306-966-5730 rm GEOL 346	gabriela.mangano@usask.ca

Dr. Neil Chilton	306-966-4407 rm 320.7 CSRB	neil.chilton@usask.ca
Dr. Doug Smith (Labs)	306-966-4415 rm G11.7 Thorv	dh.smith@usask.ca

Communicating With Your Instructors: Your instructors are routinely available by email/Canvas messages or phone. We can also schedule an in-person or a virtual meeting as needed.

Instructor Profiles & Other Information:
All instructors in PBIO 230 hold at least a PhD. Dr. Marchant and Dr. Chilton are faculty members in the Department of Biology. They teach and conduct research in the area of animal physiology and parasitology, respectively. Dr. Mángano is a faculty member in the Department of Geological Sciences. She teaches in the area of sedimentology and paleontology and conducts research in ichnology and evolutionary paleoecology. Dr. Smith is an instructor and lab coordinator in the Department of Biology with a special interest in the biology of insects. There will also be a teaching assistant assigned to help in the labs.

Required Resources

Textbooks

Brusca, R.; Moore, W.; and Shuster, S. 2016.Invertebrates.3rd edition. Oxford University Press. Available through the bookstore or online.

Electronic copies are available through a bookstore link.

This book is essential to the course. For used copies, only purchase the 3rd edition. A digital version is fine.

Additional required readings will be posted on Canvas at the discretion of the instructor.

Laboratory Manual: this will be available as a download from Canvas. You will need to print the lab exercise instructions/worksheets and bring these with you to the lab each week. You will also need your textbook during the lab

Grading Scheme

Overall, assessment is designed to ensure students have attained the learning outcomes for the course.

Assessment Item	Weighting	Relevant Learning Outcomes	Due Date and Time
Mid-Term Exam	20% of the final course grade	1, 2, 3, 4, 6, 7	Feb 15 5:30 pm
Final Exam	40% of the final course grade	1, 2, 3, 4, 6, 7	To Be Determined
Lab Quizzes (3)	40% of the final course grade (8, 12 & 20%)	2, 3, 4, 5, 7, 8	Jan 31 1:30 pm Mar 7 1:30 pm Apr 4 1:30 pm

Evaluation of Student Performance

Midterm Exam

Value: 20% of final course grade
Date: Feb 15 (to be written outside of regular class time, 5:30 to 7 pm, rm TBA)
Length: 90 minutes
Format: An in-person Canvas exam in a computer lab, with a mix of multiple choice questions and those requiring a written answer
Description: Will include all lecture material to the end of Phylum Platyhelminthes, integrating lab material as appropriate.

Final Exam

Value: 40% of final course grade
Date: Consult the Final Exam Schedule when it is released.
Length: 120 minutes
Format: An in-person Canvas exam in a computer lab, with a mix of multiple choice questions and those requiring a written answer.
Description: The exam is comprehensive in that it will cover all course material. However, material delivered since the midterm exam will be emphasized.

Laboratory Quizzes

Value: 40% of final grade (3 quizzes worth 8%, 12% and 20%)
Date: Jan 31, Mar 7 and April 4, during the regular lab period
Format: Spot test based on lab specimens and examples
Description: Students will move between stations that contain questions about specimens and examples from the lab exercises. Students will be given 1 minute to answer the question at each station in Quiz 1 & 2. Specific material that will be covered by each quiz is shown in the Detailed Course Schedule. The final lab quiz is worth 20% and will be comprehensive in scope; this is scheduled for 60 minutes.

Lab Attendance Expectations

Students are expected to attend each lab period and complete the work required of them in the lab manual. It is impossible to schedule make-up labs for this course. Students who miss a lab quiz will be assigned a mark of zero for that lab quiz. Students are required to contact one of the instructors prior to the quiz if they are unable to due to illness or extenuating personal circumstances. Marks associated with the missed quiz will be distributed to remaining course components as determined by the instructor. Note that each situation will be judged and determined separately.

Midterm and Final Examination Scheduling

Midterm and final examinations must be written on the date scheduled. The final course examinations may be scheduled at any time during the examination period (Apr 7 to 28); students should therefore avoid making prior travel, employment, or other commitments for this period. If a student is unable to write the midterm exam through no fault of their own for medical, compassionate or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be given. Students who miss the final exam must contact the College

of Arts & Science and apply for a deferred final exam. Deferred exams may utilize a different format than the regular exam, at the sole discretion of the course instructors. Students are encouraged to review all University examination policies and procedures: http://students.usask.ca/academics/exams.php

Recording of the Course

Students are not allowed to record any aspect of this course, except with the permission of the instructors or as provided for by arrangements with Access and Equity Services. Any recording made under these provisions are to only be used for the personal learning of the student who made the recording. For questions about recording and use of sessions in which you have participated, including any concerns related to your privacy, please contact your instructor. More information on class recordings can be found in the Academic Courses Policy: https://policies.usask.ca/policies/academic-affairs/academic-courses.php#5ClassRecordings..

Copyright

Course materials are provided to you based on your registration in the class, and anything created by your professors and instructors is their intellectual property, unless materials are designated as open education resources. Copyright-protected material includes exams, PowerPoint/PDF slides and other course notes. Additionally, other copyright-protected materials created by textbook publishers and authors may be provided to you based on license terms and educational exceptions in the Canadian Copyright Act (see http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html).

Before you copy or distribute others' copyright-protected materials, please ensure that your use of the materials is covered under the University's Fair Dealing Copyright Guidelines available at https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php. For example, posting others' copyright-protected materials on the open web is not covered under the University's Fair Dealing Copyright Guidelines, and doing so requires permission from the copyright holder.

For more information about copyright, please visit https://library.usask.ca/copyright/index.php where there is information for students available at https://library.usask.ca/copyright/students/rights.php, or contact the University's Copyright Coordinator at mailto:copyright.coordinator@usask.ca or 306-966-8817.

Student Feedback

The Department of Biology or the instructors may survey students regarding the course. This is generally done through an assessment near the end of term.

University of Saskatchewan Grading System

Students in PBIO 230 are reminded that the University has established a grading system to be used in all of its courses. Information on literal descriptors for grading at the University of Saskatchewan (reproduced below) can be found at: http://students.usask.ca/academics/grading/grading-system.php

Exceptional (90-100) A superior performance with consistent evidence of

- a comprehensive, incisive grasp of the subject matter;
- an ability to make insightful critical evaluation of the material given;
- an exceptional capacity for original, creative and/or logical thinking;

- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

Excellent (80-90) An excellent performance with strong evidence of

- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a very good capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

Good (70-79) A good performance with evidence of

- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative and/or logical thinking;
- a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.

Satisfactory (60-69) A generally satisfactory and intellectually adequate performance with evidence of

- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material;
- a moderate ability to examine the material in a critical and analytical manner.

Minimal Pass (50-59) A barely acceptable performance with evidence of

- a familiarity with the subject material;
- some evidence that analytical skills have been developed;
- some understanding of relevant issues;
- some familiarity with the relevant literature and techniques;
- attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner which are only partially successful.

Failure <50 An unacceptable performance

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity (https://academic-integrity.usask.ca/). Academic misconduct is a serious matter and can result in grade penalties, suspension, and expulsion.

Prepare for Integrity

Students are expected to act with academic integrity.

- Students are required to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community (tutorial link: https://libguides.usask.ca/AcademicIntegrityTutorial) .
- Students can access campus resources that support development of study skills, time and stress management, and ethical writing practices important for maintaining academic integrity and avoiding academic misconduct.

Responses to Misconduct

Students are expected to be familiar with the academic misconduct regulations (https://governance.usask.ca/student-conduct-appeals/academic-misconduct.php#About).

- Definitions appear in Section II of the academic misconduct regulations.

- The academic misconduct regulations apply regardless of type of assessment or presence of supervision during assessment completion.
- Students are advised to ask for clarification as to the specific expectations and rules for assessments in all of their courses.
- Students are urged to avoid any behaviour that could result in suspicions of cheating, plagiarism, misrepresentation of facts. Students should note that posting copyrighted course materials (e.g., notes, questions, assignments or exams) to third party websites or services or other forum or media without permission is an academic or non-academic misconduct offense.

Non-academic offenses are dealt with under the Standard of Student Conduct in NonAcademic Matters and Regulations and Procedures for Resolution of Complaints and Appeals.

Examinations with Access and Equity Services (AES)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals at any time. Those students who are registered with AES with mental health disabilities and who anticipate that they may have responses to certain course materials or topics, should discuss course content with their instructors prior to course add / drop dates. In order to access AES programs and supports, students must follow AES policy and procedures. For more information or advice, visit https://students.usask.ca/health/centres/access-equity-services.php, or contact AES at 306-966-7273 or aes@usask.ca.

Students registered with AES may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

For information on AES services for Fall 2021 please visit:
https://students.usask.ca/health/centres/access-equity-services.php#Fall2021Information

Student Supports

Academic Help for Students

The University Library offers a range of learning and academic support to assist USask undergrad and graduate students. For information on specific services, please see the Learning page on the Library web site https://library.usask.ca/support/learning.php.

Remote learning support information https://students.usask.ca/remote-learning/index.php
Class and study tips https://students.usask.ca/remote-learning/class-and-study-tips.php
Remote learning tutorial https://libguides.usask.ca/remote_learning
Study skills materials for online learning https://libguides.usask.ca/studyskills
A guide on netiquette, principles to guide respectful online learning interactions
https://teaching.usask.ca/remote-teaching/netiquette.php

Teaching, Learning and Student Experience

Teaching, Learning and Student Experience (TLSE) provides developmental and support services and programs to students and the university community. For more information, see the students' web site http://students.usask.ca.

Financial Support

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central (https://students.usask.ca/student-central.php).

Aboriginal Students' Centre

The Aboriginal Students' Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, brining Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC's Facebook page (https://www.facebook.com/aboriginalstudentscentre/) to learn more.

International Student and Study Abroad Centre

The International Student and Study Abroad Centre (ISSAC) supports student success and facilitates international education experiences at USask and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students in their transition to the University of Saskatchewan and to life in Canada. ISSAC offers advising and support on matters that affect international students and their families and on matters related to studying abroad as University of Saskatchewan students. Please visit students.usask.ca for more information.

College Supports

Students in Arts & Science are encouraged to contact the Undergraduate Student Office and/or the Trish Monture Centre for Success with any questions on how to choose a major; understand program requirements; choose courses; develop strategies to improve grades; understand university policies and procedures; overcome personal barriers; initiate pre-career inquiries; and identify career planning resources. Contact information is available at: https://artsandscience.usask.ca/undergraduate/advising/