

BIOL 224.3 (01): Animal Body Systems (CRN: 82266)

Fall 2023

MWF 11:30-12:20 pm, 1003 Education Building

Lab Sections:

(L01) M 1:30-4:20 pm, G74 Thorvaldson Bldg.

(L04) T 1:30-4:20 pm, G74 Thorvaldson Bldg.

(L05) T 5:30-8:20 pm, G74 Thorvaldson Bldg.

(L06) W 1:30-4:20 pm, G74 Thorvaldson Bldg.

Instructors:

Dr. Jack Gray

Course Coordinator

Email: jack.gray@usask.ca or Phone: 306-966-7771

Dr. Som Niyogi

Email: som.niyogi@usask.ca or Phone: 306-966-4453

Ms. Sheri Fisher (Lab Coordinator)

Email: sheri.fisher@usask.ca or Phone: 306-966-4431

Communicating with Your Instructors: Your instructors will be routinely available by email or phone. A meeting with the instructor can also be arranged, either in person or via Zoom on CANVAS, if needed. We will try to respond to your email or phone call/text quickly, but please remember that normal work hours are Monday to Friday 8:30 a.m. to 4:30 pm. Communications received outside of work hours may not be answered immediately. We may also request that you ask a question via the CANVAS Discussion board.

Instructor Profiles & Other Information: Dr. Gray and Dr. Niyogi are faculty members in the Department of Biology. They hold advanced degrees (MSc, PhD) and teach and conduct research in animal physiology. Dr. Gray and Dr. Niyogi will deliver the lectures. Ms. Fisher holds an advanced degree in biology and is responsible for coordinating all aspects of the laboratories. Note that your lab group will also be assigned a laboratory teaching assistant who will assist you in the lab periods and be responsible for grading your lab assignments, pre-lab quizzes and exams. The teaching assistants work under Ms. Fisher's supervision and are senior undergraduate or graduate students at the University.

Catalogue Description

We will study the problems all animals overcome in order to survive and reproduce, and the different body systems that must deal with both unique and common environmental challenges. **Prerequisite(s):** BIOL 120. Note that BIOL 121 is strongly recommended. Students with credit for BIOL 203 or BIOL 217 or HSC 208 or PHSI 208 or BMSC 224 will not receive credit for BIOL 224.

Land Acknowledgement

As we gather here today, we acknowledge that the Saskatoon campus of the University of Saskatchewan is **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.

Learning Outcomes

By the completion of this course, students will be expected to:

1. Describe the organization of the major body systems in animals. (Knowledge).
2. Explain how processes at the cellular, tissue and organ levels link to whole animal physiology. (Understand).
3. Contrast homeostatic mechanisms and evolutionary adaptations in the vertebrate body that allow animals to respond to changes in their environment. (Understand, analyze)
4. Compare vertebrate and invertebrate body systems in selected examples. (Understand, analyze).
5. Quantify select physiological variables in a laboratory setting. (Analyze)
6. Interpret experimental results and draw appropriate conclusions in the context of physiological concepts. (Apply).
7. Construct scientific graphs and tables. (Apply, create).
8. Write concise reports to evaluate results obtained during scientific experiments. (Evaluate, create).
9. Work cooperatively in a small group setting to complete assigned tasks.
10. Promote academic integrity and professionalism.

Note: The learning outcomes for BIOL 224 encompass course-specific content, skills, and long-term attitudes or values. The descriptors shown in the parentheses after each learning objective refers to the placement of active verbs within Bloom's taxonomy of educational objectives. Specific skills transferable to other university level courses are developed in outcomes 5, 7, 6 and 8, whereas outcomes 9 and 10 address learner attitude/values. 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:

<https://policies.usask.ca/policies/academic-affairs/academic-courses.phpaffairs/academic-courses.php>

Information on literal descriptors for grading at the University of Saskatchewan and more can be found in the Academic Courses Policy on course delivery, examinations and assessment of students learning:

<http://students.usask.ca/academics/grading/grading-system.php>

Course Overview:

The course normally consists of two hours and thirty minutes of face-to-face lectures on the weekly schedule (50 minutes each MWF). Posted lecture materials may include Power Point slides, selected readings from the textbook or scientific literature, or other material that teaches physiological concepts and details.

Lectures will be complemented by lab exercises, which are listed in the Class Lab Schedule below. These lab exercises are used to provide a practical illustration of some of the major lecture concepts and are coordinated with lecture materials. Completion of the labs is a required course component. The lab component of the course consists of eight hands-on lab exercises (each 2 hrs 50 minutes). The schedule of the labs is provided below. The lab schedule below indicates due dates for all group assignments, pre-lab quizzes and exams.

Class and Laboratory Schedule

Week/Dates	Major Lecture Topics	Laboratory Activity	Lab: Student Work Due/Other Types of Assessments
Weeks 1 Sept. 4 <i>Labour Day Holiday (No Lecture)</i> Sept. 6, 8	Nature and purpose of class. Evolutionary aspects of animal kingdom. Dr. Gray	No lab scheduled	Nothing due
Week 2 Sept. 11,13,15	Communication & integration in the animal body – Homeostasis. Dr. Gray	No lab scheduled Complete the Academic Integrity Tutorial as homework. Pre-Lab Concept Quiz is also to be completed before Lab #1	All Sections: Friday Sept 15th at 4p.m. ACADEMIC INTEGRITY TUTORIAL CERTIFICATE DUE submit via CANVAS

<p>Week 3 Sept. 18, 20, 22</p>	<p>Nervous systems. Dr. Gray</p>	<p>Lab #1 Highlighting Homeostasis</p>	<p>Prelab Concepts Quiz #1 Due 30 minutes before the start of your in-person Lab session. Group lab report #1 due at end of lab period. Submit via CANVAS.</p>
<p>Week 4 Sept. 25, 27 Sept. 29 <i>National Day of Truth and Reconciliation (No Lecture)</i></p>	<p>Nervous systems Sensory systems Skeletal and Muscle Physiology. Dr. Gray</p>	<p>Lab #2 Neural Integration</p>	<p>Prelab Concepts Quiz #2 Due 30 minutes before the start of your in-person Lab session. Group lab report #2 due at end of lab period. Submit via CANVAS.</p>
<p>Week 5 Oct. 2, 4, 6</p>	<p>Skeletal & Muscle Physiology. Dr. Gray</p>	<p>Lab #3 Sensory Neuron Action Potentials</p>	<p>Prelab Concepts Quiz #3 Due 30 minutes before the start of your in-person Lab session. Group lab report #3 due at end of lab period. Submit via CANVAS.</p>
<p>Week 6 Oct. 9 <i>Thanksgiving Holiday (No Lecture)</i> Oct. 11, 13</p>	<p>Osmoregulation. Dr. Gray Oct. 13. Midterm Lecture Exam.</p>	<p>No Lab Period</p>	

<p>Week 7 Oct. 16, 18, 20</p>	<p>Osmoregulation Dr. Gray</p>	<p>Lab #4 Skeletal Muscle Physiology</p>	<p>Prelab Concepts Quiz #4 Due 30 minutes before the start of your in-person Lab session. Group lab report #4 due at end of lab period. Submit via CANVAS.</p> <p>Review lab exam #1 video</p>
<p>Week 8 Oct. 23, 25, 27</p>	<p>Respiratory Systems. Dr. Niyogi</p>	<p>Lab Exam #1</p>	<p>Lab Exam #1 In person during regular lab period.</p> <p>Schedule of student writing times to be posted in Canvas</p> <p>Submit via CANVAS</p>
<p>Week 9 Oct. 30, Nov. 1, 3</p>	<p>Circulatory Systems. Dr. Niyogi</p>	<p>Lab #5 Osmoregulation</p>	<p>Prelab Concepts Quiz #5 Due 30 minutes before the start of your in-person Lab session. Group lab report #5 due at end of lab period. Submit via CANVAS.</p>
<p>Week 10 Nov. 6, 9, 10</p>	<p>Fall Term Break</p>	<p>No lab period</p>	<p>Nothing Due</p>
<p>Week 11 Nov 13, 15, 17</p>	<p>Digestive Systems. Dr. Niyogi</p>	<p>Lab #6 Respiratory Physiology</p>	<p>Prelab Concepts Quiz #6 Due 30 minutes before the start of your in-person Lab session. Group lab report #6 due at end of lab period. Submit via CANVAS.</p>

<p>Week 12mn Nov. 20, 22, 24</p>	<p>Metabolism & Body Temperature Regulation. Dr. Niyogi</p>	<p>Lab #7 Circulatory System Physiology</p>	<p>Prelab Concepts Quiz #7 Due 30 minutes before the start of your in-person Lab session. Group lab report #7 due at end of lab period. Submit via CANVAS.</p>
<p>Week 13 Nov. 27, 29, Dec. 1</p>	<p>Endocrine systems. Dr. Niyogi</p>	<p>Lab #8 Metabolism</p>	<p>Review lab exam #1 & #2 videos</p> <p>Prelab Concepts Quiz #8 Due 30 minutes before the start of your in-person Lab session. Group lab report #8 due at end of lab period. Submit via CANVAS.</p> <p>Evaluations due Dec. 2 by 4:30 p.m. Submit via Survey Monkey</p>
<p>Week 14 Dec. 4, 6, 8</p>	<p>Reproductive Physiology Review for final exam. Dr. Niyogi</p>	<p>Lab Exam #2</p>	<p>Lab Exam #2 In person during regular lab period.</p> <p>Schedule of student writing times to be posted in Canvas</p> <p>Submit via CANVAS</p>

Midterm and Final Examination Scheduling

Midterm and final examinations will be in person and must be written on the date and location scheduled.

Final examinations may be scheduled at any time during the examination period (**December 9th to 23rd, 2023**); students should therefore avoid making prior travel, employment, or other commitments for this period. If a student is unable to write an exam through no fault of their own for medical or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be given.

For the midterm lecture exam or the lab exams, students must contact Dr. Gray or Ms. Fischer, respectively, within three business days following the missed exam. For the final exam, students are required to contact the College of Arts and Science within three business days following the missed exam. Students are expected to review all examination policies and procedures:
<http://students.usask.ca/academics/exams.php>

Required Resources

Textbooks

Biology - Exploring the Diversity of Life (5th Canadian Edition) by Fenton et al., Nelson Education Ltd., 2022. A hardcopy of the textbook can be purchased through the USask bookstore or an electronic version can be purchased online at <https://www.cengage.ca/shop>

Laboratory Manual for BIOL 224 (Fall of 2023 edition must be purchased). An electronic version of the \$40 manual must be purchased from the University of Saskatchewan Bookstore:
<https://shop.usask.ca/Item/item/40000207072/course/UOFS,201901,BIOL,BIOL224>,

You will be provided with a unique access code for the digital copy of your lab manual affixed to a sheet of paper. Each student registered in Biology 224 must purchase an access code for the lab manual. Students who fail to do so will be given a 0% on all prelab concept quizzes, group assignments and group and self-assessment in the lab. The access code is linked to your registration in BIOL 224, and lab manual purchase will be monitored. Do not lose your access code, as you will have to purchase another. We recommend taking a photo of your access code in case you lose it. You may print one copy of the manual for your own use. You are not permitted to distribute the manual to others in any form, electronic or otherwise. To do so is considered copyright infringement and students who do so will be subject to disciplinary action in accordance with University of Saskatchewan academic conduct policies.

Textbooks are available from the University of Saskatchewan Bookstore:
<https://bookstore.usask.ca/students.php>

Downloads

PDF versions of Power Point slides of the lectures and laboratory materials will be available for download as appropriate through the course CANVAS.

Supplementary Resources

Your instructors may make supplementary materials available to you through the course CANVAS. Other study materials may also be suggested which can be accessed from USask library online resources. More information about these is provided in the lab manual as appropriate.

Evaluation of Student Performance

Grading Scheme

Assessments that will contribute to your final grade are:

Assessment	Value as percent of final grade
Midterm Exam	15
Final Exam	45
Group Lab Reports	10
Pre-Lab Quizzes	4
Lab Exam #1	9
Lab Exam #2 (comprehensive)	15
Group & Self Assessments	2
Total	100

Evaluation Components

Midterm Lecture Exam

Value: 15% of final course grade
Date: **Oct. 13, 2023 - during Lecture period**
Length: 50 minutes
Format: 40 multiple-choice questions
Description: Will include all lecture materials to end of Skeletal and Muscle Physiology.
Exam will be in person in Educ 1003.

Final Exam

Value: 45% of final grade
Date: Consult the Final Exam Schedule
Length: 180 minutes
Format: 100 multiple choice questions
Description: The exam is comprehensive as it will cover all lecture materials. However, material delivered since the midterm exam will be emphasized. **Will be conducted in person as a timed exam.** Details will be provided. Consult the Final Exam Schedule for location.

Completion of USask Academic Integrity Tutorial

Value: 0% of final grade but completion required as a lab prerequisite
Date: Due by Friday Sept 15th at 4p.m.
Format: Online tutorial
Description: Our goal is to ensure a learning and teaching environment with a high standard of academic integrity for BIOL 224. The University of Saskatchewan has developed some outstanding web-based resources to help students understand and practice academic integrity. This includes an opportunity to complete three modules dealing with various aspects of academic integrity. You will be sent a certificate on completion of each of the modules. As a BIOL

224 student, you must complete the first module, and upload the certificate as a CANVAS assignment. It is acceptable if you have received the certificate of completion for the first module as a requirement in other courses. We also recommend completing the other two modules. This assignment will be graded as complete/incomplete (contributes 1-4 marks of 32 marks on the group & self-assessment rubric; mark based on timely completion).

Laboratory Group Reports

Value: 10% of final grade
Due Date: See Course Schedule
Format: These will mostly consist of figures and tables. Data obtained during the lab periods are to be organized and presented in a scientific manner in these reports.
Description: All group members are to participate in the preparation of these reports. Figures will be drawn using MS Excel. A scientific figure legend will be written and included with each graph. These must be printed and handed in to your lab demonstrator before the end of the lab period. Complete instructions about these group reports are contained in your lab manual.

Quizzes

Value: 4% of final grade
Date: See Course Schedule
Format: Eight online quizzes to precede each lab period, each worth 0.5% of the final grade.
Description: The pre-lab quizzes will be 10 minutes in duration and test material for the upcoming lab exercise. They will be made available online following the previous week's lab, and will consist of multiple choice, or short answer questions with answers to be submitted through CANVAS. The quizzes are to be completed by each student working individually and will require use of the lab manual and textbook. Other reference material is allowed as needed. Additional information about the pre-lab quizzes is found in your lab manual.

Laboratory Exams

Value: 9 & 15% of final grade
Date: See Course Schedule
Format: This will be a mixture of short written answers, long answer, calculations, hot spot and multiple-choice questions.
Description: The first lab exam will be 1 hour in duration and test material from lab exercises 1 – 4. The second lab exam is comprehensive with an emphasis on Labs 5 – 8 and will be 1.25 hours in duration. Calculators allowed. Laptops permitted as exam is conducted using CANVAS. Additional information about the lab exams is found in your lab manual and will be provided in the lab review videos sessions.

Group and-Self Assessment Survey

Value: 2% of final grade
Date: Due Dec. 1st by 4:30
Format: Survey based on work within their group.

Description: Students are expected to actively contribute to the work being performed within your group. Rubrics that will be used to determine these contributions will be posted on CANVAS. You are encouraged to review the rubric to understand the exact details of how you will be assessed for your contributions. Your contribution to the work of your group will be assessed by the other members in your group and yourself. It is fully expected that students will collaborate within their group to help each other with the collection, analysis and presentation of data. Completion of the assessment survey and academic integrity tutorial will also contribute to the grade. This assessment will count for 2% of your final grade.

Submitting Assignments

Each week your group will submit a collaborative assignment via CANVAS at the end of the lab period. The lab reports will be graded by the teaching assistants who will also watch for plagiarism. Reports will be graded and returned on a schedule such that students will have feedback about their work after they have submitted the first assignment. Grades will be assigned based on the quality of the data presentation, grammar, spelling, scientific writing, and other aspects of the assignment. Additional information about the format of the assignments is contained in the lab manual; students must read this carefully. Marks from the midterm exam will be available 7 to 10 days after the exam, well in advance of the last day to withdraw deadline.

Late Assignments

Lab assignments submitted after the deadline will not be accepted and will be assigned a grade of 0%.

Criteria That Must Be Met to Pass

Students must write the midterm and final exams, complete the lab activities and exercises, and obtain an overall grade of 50% in order to pass the course.

Attendance Expectations

“Regular and punctual attendance in their classes is expected of all students (including lectures, seminars, laboratories, tutorials, etc.)”

– USask Academic Course Policy

“...class attendance a better predictor of college grades than any other known predictor of academic performance...”

- Credé et al (2010)

<https://doi-org.cyber.usask.ca/10.3102/0034654310362998>

All components of BIOL 224 matter. Students are expected to attend all lectures in person. **Lectures will not be recorded.** If you miss a lecture, it is your responsibility to obtain notes from your classmates.

Attendance of labs is a requirement for passing this course. Students are expected to be on time, on all scheduled labs. It is impossible to schedule make-up labs for this course. Students who miss a lab period are assigned a mark of zero for the group lab report. Students are advised to consult the lab manual for further information about procedures to follow when they are too ill to attend the lab period or are facing extenuating personal circumstances.

Experiential Learning

Experiential learning for BIOL 224 takes the form of laboratory activities and exercises. See your lab manual for details.

Recording of the Course

In person attendance of lectures is expected. Please note that 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 available at:

[https://policies.usask.ca/policies/academic-affairs/academic-courses.php - 5ClassRecordingsaffairs/academic-courses.php#5ClassRecordings](https://policies.usask.ca/policies/academic-affairs/academic-courses.php-5ClassRecordingsaffairs/academic-courses.php#5ClassRecordings)

Copyright

Course material created by your professors and instructors is their intellectual property and **cannot be shared without written permission**. This includes exams, PowerPoint/PDF lecture slides and other course notes. If materials are designated as open education resources (with a creative commons license) you can share and/or use them in alignment with the [CC license](#). 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](#).

You are responsible for ensuring that any copying or distribution of materials that you engage in is permitted by the University's "Use of Materials Protected By Copyright" Policy. For example, posting others' copyright-protected materials on the open internet is not permitted by this policy unless you have copyright permission or a license to do so. For more copyright information, please visit <https://library.usask.ca/copyright/students/index.php> or contact the University Copyright Coordinator at 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.

Academic Integrity

The University of Saskatchewan is committed to the highest standards of academic integrity. <https://academic-integrity.usask.ca/>

It is the student's responsibility to read the [Regulations on Academic Misconduct](#) and to avoid any behaviours that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence.

For help developing the skills for meeting academic integrity expectations, see: <https://academic-integrity.usask.ca/students.php>

Students are encouraged to ask their instructors for clarification on academic integrity requirements.

All students are encouraged to be aware of the rules for courses set out in the [Academic Courses Policy on Class Delivery, Examinations, and Assessment of Student Learning](#).

You are required to complete the first module of the Academic Integrity Tutorial about the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community –

<https://libguides.usask.ca/AcademicIntegrityTutorial>

In BIOL 224, you will need to have a clear understanding about what constitutes plagiarism. If you have any questions about this, contact one of your instructors for advice. The Writing Center can also assist you with your writing and help you avoid plagiarism <https://library.usask.ca/studentlearning/writing-help/>

Note: Additional information about student misconduct specific to BIOL 224 is found in the laboratory manual. BIOL 224 students are required to read and understand the information about misconduct that is presented in the laboratory manual.

Artificial intelligence text generator tools (also known as large language models) **are not** permitted to be used in any assessments for this course. Any use of such tools will be considered academic misconduct in this course.

Students wanting to connect their assessment in this course to assessments they have completed in another course must get explicit permission of the instructor in order to avoid potential academic misconduct of self-plagiarism.

Access and Equity Services (AES) for Students

Access and Equity Services (AES) is available to provide support to students who require accommodations due to disability, family status, and religious observances.

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.

Students who require accommodations for pregnancy or substantial parental/family duties should contact AES to discuss their situations and potentially register with that office.

Students who require accommodations due to religious practices that prohibit the writing of exams on religious holidays should contact AES to self-declare and determine which accommodations are appropriate. In general, students who are unable to write an exam due to a religious conflict do not register with AES but instead submit an exam conflict form through their PAWS account to arrange accommodations.

Any student registered with AES, as well as those who require accommodations on religious grounds, may request alternative arrangements for mid-term and final examinations by submitting a request to AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

For more information or advice, visit <https://students.usask.ca/health/centres/access-equity-services.php>, or contact AES at 306-966-7273 (Voice/TTY 1-306-966-7276) or email aes@usask.ca.

Student Supports

Academic Help – University Library

Visit the [University Library](#) and [Learning Hub](#) to find supports for undergraduate and graduate students with first-year experience, study skills, learning strategies, research, writing, math and statistics. Students can attend [workshops](#), access [online resources and research guides](#), book [1-1 appointments](#) or hire a [subject tutor](#) through the [USask Tutoring Network](#)

Connect with library staff through the [AskUs](#) chat service or visit various [library locations](#) on campus.

Enrolled in an online course? Explore the [Online Learning Readiness Tutorial](#).

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' website <http://students.usask.ca>.

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: (<http://artsandscience.usask.ca/undergraduate/advising/>)

Financial Support

Any student who faces unexpected 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>.

Gordon Oakes Red Bear Student Centre

The Gordon Oakes Red Bear Student Centre) is dedicated to supporting Indigenous 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 an intercultural gathering space that brings Indigenous and non-Indigenous students together to learn from, with and about one another in a respectful, inclusive, and safe environment. Visit <https://students.usask.ca/indigenous/index.php> or students are encouraged to visit the ASC's website <https://students.usask.ca/indigenous/gorbosc.php>

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. Visit <https://students.usask.ca/international/issac.php> for more information.