



UNIVERSITY OF
SASKATCHEWAN

Department of Biology

COURSE SYLLABUS

COURSE TITLE: BIOL 224 - Animal Body Systems

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| COURSE CODE: | 82266 | TERM: 1 | Fall 2017 |
| COURSE CREDITS: | 3.0 | DELIVERY: | Lecture & Practicum (Lab) |
| CLASS SECTION: | 01 | START DATE: | 6 September |
| LECTURE LOCATION: | 106 Biology Bldg. | LAB LOCATION: | G74 Thorvaldson Bldg. |
| LECTURE TIME: | MWF 8:30 to 9:20 am | LAB TIME: | 1:30-4:20 pm |
| WEBSITE: | Via Blackboard | | |

Course Description

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: 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.

Learning Outcomes

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

1. Understand the organization of the major body systems in vertebrate animals and those from a limited number of relevant invertebrate examples;
2. Understand the basic concepts of organ system physiology and be able to link processes that occur at the cellular, tissue and organ levels to whole animal physiology;
3. Appreciate the role that evolutionary adaptation has played in the organization of the vertebrate body, and how homeostasis allows animals to respond to short term changes in their environment;
4. Learn how selected physiology variables can be measured in a laboratory setting and be able to explain experimental results in the context of basic physiological concepts;
5. Become competent at quantifying, analyzing and presenting scientific data, drawing and interpreting scientific graphs and tables, and writing descriptive figure legends;
6. Learn to work efficiently in a group setting.

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:

http://www.usask.ca/university_secretary/LearningCharter.pdf

More information on University policies on course delivery, examinations and assessment of student learning can be found at:

http://www.usask.ca/university_secretary/council/academiccourses.php

Course Overview

The course consists of 50 min of lecture three times a week. This will result in approximately 30 hours of face-to-face instruction in the lectures. Eight days of hand-on lab exercises (2 hrs 50 minutes) are also included in this course. In these exercises, you will work in small groups to perform physiological experiments and analyze and present your data. These exercises are used to provide a practical illustration of some of the major lecture concepts and are coordinated with lecture material as shown in the schedule below. Completion of the labs is a required course component.

Class and Laboratory Schedule

| Week/Dates | Lecture, Instructor, Major Lecture Topics and Readings | Laboratory Activity Readings | Student Work Due/Other Types of Assessment |
|------------------------|--|--|--|
| 1. Sept. 6 & 8. | Dr. Angrini: Nature and purpose of class; Evolutionary considerations; environments & animal adaptation; Homeostasis | <i>No lab scheduled</i> | Nothing due |
| 2. Sept. 11, 13 & 15. | Dr. Angrini: Communication & Integration – Introduction to the endocrine system | <i>No lab scheduled</i> | Nothing due |
| 3. Sept. 18, 20 & 22. | Dr. Angrini: Nervous system physiology | Lab #1 Lab Organization, Introduction to Excel & LabScribe. <u>Lab Manual</u> : Introduction | Prelab Quiz 1 Group lab report by end of lab period |
| 4. Sept. 25, 27 & 29. | Dr. Angrini: Nervous system. Muscle physiology | Lab #2 Sensory Physiology <u>Lab Manual</u> : Exercise 1 | Prelab Quiz 2 Group lab report by end of lab period |
| 5. Oct. 2, 4 & 6. | Dr. Angrini: Sensory systems | Lab #3 Recording Action Potentials | Prelab Quiz 3 Lab Test 1 Group lab report by end of lab period |
| 6. Oct 9 | Thanksgiving Holiday | | |
| 6. Oct. 11 & 13 | Dr. Angrini: Osmoregulation | <i>No lab scheduled due to holiday</i> | Nothing due |
| 7. Oct. 16, 18, 20. | Dr. Angrini: Osmoregulation Dr. Marchant: Respiratory Physiology | Lab #4 Skeletal Muscle Physiology (TEST 1) | Prelab Quiz 4 Group lab report by end of lab period |
| 8. Oct. 23 | Midterm Exam (in lecture) | | |
| 8. Oct 25 & 27 | Dr. Marchant: Circulatory System Physiology | Lab #5 Osmoregulation | Prelab Quiz 5 Group lab report by end of lab period |
| 9. Oct. 30, Nov. 1 & 3 | Dr. Marchant: Circulatory System Physiology Temperature & metabolism | Lab #6 Respiratory Physiology | Prelab Quiz 6 Lab Test 2 Group lab report by end of lab period |

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| 10. Nov. 6, 8 & 10 | Dr. Marchant: Digestive System Physiology. | Lab #7 Circulatory System Physiology | Prelab Quiz 7 Group lab report by end of lab period |
| 11. Nov. 13 to 17 | University Break | | |
| 12. Nov. 20, 22 & 26 | Dr. Marchant: Food & Energy Balance Reproduction & Development | Lab #8 Metabolism (TEST 2) | Prelab Quiz 8 Lab Test 3 at start Group lab report by end of lab period |
| 13. Nov. 27 & 29, Dec. 1 | Dr. Marchant: Reproduction & Development | Lab Review | Nothing due. <i>Study for lab exam</i> |
| 14. Dec. 4 & 6 | Dr. Marchant: Reproduction & Development Course wrap-up | Laboratory Exam | Laboratory Exam (1.5 Hours, Written Answer & Multiple Choice) |

FINAL EXAMS start Dec 8. Date and location will be announced by the Registrar's Office.

Lab days / times:

Monday 1:30-4:20 p.m.

Tuesday 8:30-11:20 a.m.

Tuesday 1:30-4:20 p.m.

Wednesday 1:30-4:20 p.m.

All laboratories are held in room G74 of the Thorvaldson building.

Instructors:

Dr. Tracy Marchant Room 322 Biology 306-966-4420
tracy.marchant@usask.ca

Dr. Manar Angrini Room 324 Biology 306-966-4437
manar.angrini@usask.ca

Ms. Sheri Fisher Room G77.3 Thorvaldson 306-966-4431
 Lab Coordinator sheri.fisher@usask.ca

Office Hours: The instructors will be available in their offices on a drop-in basis. However, please note that instructors have other commitments that may take them away from their office. Specific appointments can be set by email or through a phone call. Email responses to specific questions about course material are at the discretion of each instructor. Each instructor will provide information about individual policies in the lecture or laboratory.

Instructor Profiles & Other Information: Dr. Marchant and Dr. Angrini are faculty member in the Department of Biology. They hold advanced degrees (MSc, PhD) and teach and conduct research in the area of biology and animal physiology. 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 demonstrator who will assist you during the lab periods and be responsible for grading your lab assignment and quizzes. The lab demonstrators are senior undergraduate or graduate students at the University.

Required Resources

Textbooks

Biology - Exploring the Diversity of Life (3rd Canadian Edition) by Russell et al., Nelson Education Ltd., 2016. Copies of this textbook will be on reserve in the Natural Sciences Library.

Laboratory Manual for BIOL 224 (Fall 2017 edition must be purchased). An electronic version of the \$25 manual must be purchased from the University of Saskatchewan Bookstore: www.usask.ca/consumer_services/bookstore/textbooks. 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 pre-lab quizzes and group reports 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.

Electronic Resources

The laboratory portion of this course will require a working knowledge of computers and various computer programs, including MS Excel and Word. Computers will be used extensively to collect and analyze data and prepare reports in the laboratory. You will need to access your University computer account during the laboratory; make sure you know your university nsid and password and how to log on to your account. Further details are in the lab manual.

Downloads

These will be available as appropriate through the course Blackboard. The only document that you are required to download and read is the course *syllabus*. **Please note that instructor's Power Point slides may be provided to you as a courtesy.** You are not required to download or print these slides. While we will endeavor to have the lecture Power Point slides posted sometime in advance of the lectures, we will not guarantee this. Each instructor will provide you with additional information about posted documents.

Supplementary Resources

From time to time, your instructors may make supplementary material available to you through the course Blackboard. This material **will not replace the lecture or lab experience** and you are encouraged to attend all lectures and take your own notes. A number of paper-based resources for the laboratory may be placed on reserve for you in the Natural Sciences Library; information about these is provided in the lab manual as appropriate.

Grading Scheme

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| Midterm Exam: | 20 |
| Final Exam: | 45 |
| Group Lab Reports: | 8 |
| Pre-Lab Quizzes: | 3 |
| Lab Tests: | 9 |
| Lab Exam: | 15 |
| Total: | 100% |

Evaluation of Student Performance

Midterm Exam

Value: 20% of final course grade
Date: Oct. 23. Midterm Lecture Exam.
Length: 50 minutes
Format: 40 multiple-choice questions; scan marked.
Description: Will include all lecture material to end of Osmoregulation. Calculators allowed. No phones, laptops, tablets or other material allowed. Held during lecture time slot.

Final Exam

Value: 45% of final grade
Date: Consult the Final Exam Schedule
Length: 3 hours
Format: 100 multiple-choice questions; scan marked.
Description: The exam is comprehensive in that it will cover all lecture material. However, material delivered since the midterm exam will be emphasized. Calculators allowed. No phones, laptops, tablets or other material allowed.

Laboratory Group Reports

Value: 8% 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.

Laboratory PreLab Quizzes

Value: 3% of final grade
Date: See Course Schedule
Format: Eight online quizzes to precede each lab period, each worth 0.375% 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, fill-in-the-blank, or true-false questions with answers to be submitted through Blackboard. 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 Tests

Value: 9% of final grade

Date: See Course Schedule
Format: Two tests, worth 4.5% of the final grade.
Description: The tests will be 20 minutes in duration and test material from the previous lab exercises. The questions will be multiple-choice, fill-in-the-blank or require a short written answer. There may be calculations involved. Calculators allowed. No phones, laptops, tablets or other material allowed. Additional information about the lab tests is found in your lab manual.

Laboratory Exam

Value: 15% of final grade
Date: December 4 to 6 (in lab period)
Format: This will be a mixture of short written answers, calculations and multiple-choice questions.
Description: The lab exam will be 1.5 hours in duration and test material from all previous lab exercises. Calculators allowed. No phones, laptops, tablets or other material allowed. Additional information about the lab exam is found in your lab manual and will be provided in the lab review session.

Submitting Assignments/Feedback to Students

One copy of each group lab report must be printed and turned in to the lab demonstrator not later than 4:30 pm in the lab period in which it is due. Barring unforeseen circumstances, we will endeavor to have the lab reports graded and returned near the beginning of the subsequent lab period. Grades will be assigned based on the quality of the data presentation and on the figure legends and conclusions. Additional information about this is contained in the lab manual. Marks from machine-graded exams are usually available within one week. The multiple-choice questions will not be posted after the exam - students can meet with the instructor to discuss correct answers and review their performance.

Late Assignments

Prelab quizzes must be completed before the lab period as indicated in the lab manual. Group lab reports submitted after 11:20 am for the morning labs or 4:30 pm for the afternoon labs will be assigned a grade of zero. There are no exceptions to this policy.

Attendance Expectations

Students are expected to attend, and be on time, for 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.

Criteria That Must Be Met to Pass

Students must write the final exam in order to pass the course. Students who do not write the final exam will be assigned a final course grade of 49%, or lower depending on their performance in other aspects of the course, along with a grade comment of INF (Incomplete Failure). The final grade will be adjusted if a deferred final exam is written (see below).

Midterm and Final Examination Scheduling

Midterm and final examinations must be written on the date scheduled. If a student is unable to write a midterm or the lab exam through no fault of his or her own for medical or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be

given. Note: students should consult the laboratory manual for information specific to missed laboratory assignments and quizzes. The University Administration schedules final course examinations between December 9 to 22. Students should therefore avoid making prior travel, employment, or other commitments for this period. **Students who miss the final exam must contact the College and apply for a deferred final exam.** Deferred exams may utilize a different format than the regular exam, at the sole discretion of the instructors. Students are encouraged to review all University examination policies and procedures:
<http://www.usask.ca/calendar/exams&grades/examregs/>

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 Disability Services for Students. Any recording made under these provisions are to only be used for the personal learning of the student who made the recording.

Copyright

All previously-published material is used this course under the fair-use provisions of Canadian copyright legislation. The instructors retain copyright of their own work. Students shall refrain from redistributing any material provided to them, except with the permission of the instructors.

Student Feedback

The Department of Biology or the instructors may survey students regarding the course. This is generally done through an in-class assessment.

University of Saskatchewan Grading System

Students in BIOL 224 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/grades/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 and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals. For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at: <http://www.usask.ca/secretariat/student-conduct-appeals/>

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.

Student Supports

Student Learning Services

Student Learning Services (SLS) offers assistance to U of S undergrad and graduate students. For information on specific services, please see the SLS web site <https://www.usask.ca/ulc/>.

Student and Enrolment Services Division

The Student and Enrolment Services Division (SESD) focuses on providing developmental and support services and programs to students and the university community. For more information, see the SESD web site <http://www.usask.ca/sesd/>.

Examinations through Disability Services for Students (DSS)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and

referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <https://students.usask.ca/health/centres/disability-services-for-students.php#Registration> or contact DSS at 966-7273 or dss@usask.ca. Students registered with DSS may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through DSS by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS. Students who are in need of accommodation for other aspects of BIOL 224 must present the appropriate letter from DSS to the course instructors. Accommodation for the midterm, the final exam and the lab exam must be made through regular DSS procedures.