Department of Physiology and Pharmacology

PHYSIOL 4530B Skeletal Health and Disease

Course outline for Winter 2021

Although this academic year might be different, Western University is committed to a thriving campus. We encourage you to check out the Digital Student Experience website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: https://www.uwo.ca/health/.

1. Technical Requirements:

- Stable internet connection
- Laptop or computer
- Working microphone
- Working webcam

2. Course Overview and Important Dates:

<table>
<thead>
<tr>
<th>Delivery Mode</th>
<th>Dates</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>Wednesdays</td>
<td>9:30-11:30 am</td>
</tr>
</tbody>
</table>

*Details about design and delivery of the course are listed below in Section 4

<table>
<thead>
<tr>
<th>Classes Start</th>
<th>Reading Week</th>
<th>Classes End</th>
<th>Study day(s)</th>
<th>Exam Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 11</td>
<td>Feb 13 - 21</td>
<td>April 12</td>
<td>April 13</td>
<td>April 14 - 30</td>
</tr>
</tbody>
</table>

*March 15, 2021: Last day to drop a second-term half course or a second-term full course without penalty

3. Contact Information

<table>
<thead>
<tr>
<th>Course Coordinator</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheryle Séguin</td>
<td>Use OWL message or email <a href="mailto:cheryle.seguin@schulich.uwo.ca">cheryle.seguin@schulich.uwo.ca</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructors &amp; Teaching Assistant</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank Beier</td>
<td><a href="mailto:fbeier@uwo.ca">fbeier@uwo.ca</a></td>
</tr>
<tr>
<td>Tom Appleton</td>
<td><a href="mailto:Tom.Appleton@sjhc.london.on.ca">Tom.Appleton@sjhc.london.on.ca</a></td>
</tr>
<tr>
<td>Jeff Hutchinson (TA)</td>
<td><a href="mailto:jhutch48@uwo.ca">jhutch48@uwo.ca</a></td>
</tr>
</tbody>
</table>
4. Course Description and Design

Physiology 4530B Skeletal Health and Disease
Winter Term 2021

Musculoskeletal disorders such as osteoarthritis, osteoporosis and disc degeneration have huge impact on individuals’ quality of life and the healthcare system, especially as our population ages. Recent evidence shows that events that are physiologically linked to the skeleton can drive pathology in other tissues, such as the mineralization of blood vessels in atherosclerosis. This course will provide an overview of the development and biology of skeletal tissues, introduce current techniques used to study skeletal physiology and examine the biological bases of musculoskeletal diseases and their treatments.

Requisites:
Prerequisite(s): Phys3120 (Human Physiology); Phys 3140A (Cellular Physiology)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Dates</th>
<th>Time</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual asynchronous lectures and coursework</td>
<td>N/A</td>
<td>N/A</td>
<td>weekly</td>
</tr>
<tr>
<td>Virtual synchronous course debates</td>
<td></td>
<td>Wednesday 9:30-11:30 am</td>
<td>refer to detailed course schedule</td>
</tr>
</tbody>
</table>

☒ Asynchronous pre-work must be completed prior to synchronous sessions
☒ Attendance at synchronous sessions is required
☒ A recording will be provided for synchronous sessions

All course material will be posted to OWL: http://owl.uwo.ca. Any changes will be indicated on the OWL site and discussed with the class. Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL. If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Senate regulation regarding requisites: Unless you have either the requisites for this course or written special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Accessibility Statement: Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

5. Course Objectives & Learning Outcomes

This course will provide an overview of the development and biology of skeletal tissues, including cartilage, bone, and spine, framed in the context of understanding common
pathologies affecting each. Lectures are designed to provide necessary content on this material, and introduce current techniques used to study skeletal physiology and pathobiology. In addition to lectures, content is delivered through student-led learning, presented as debates on research papers relevant to each content module. Student participation (through online participation) is expected. By the end of this course, students are expected to be familiar with the physiology of the musculoskeletal system, its contribution to systemic health, and the pathobiology underlying common diseases. Moreover, they are expected to understand and apply common research methods in this area.

6. Course Content & Schedule

☒ Asynchronous course material will be available through OWL

☒ Synchronous course activities will be held Wed 9:30-11:20 via Zoom

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>TOPIC</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 13</td>
<td>Introduction to the skeleton and skeletal development</td>
<td>Beier</td>
</tr>
<tr>
<td>2</td>
<td>Jan 20</td>
<td><strong>Guest Lecture</strong>: Cartilage Biology and Pathology of osteoarthritis (online synchronous)</td>
<td>Appleton</td>
</tr>
<tr>
<td>3</td>
<td>Jan 27</td>
<td>Bone Biology (bone remodeling, endocrinology of the skeleton)</td>
<td>Beier</td>
</tr>
<tr>
<td>4</td>
<td>Feb 3</td>
<td><strong>Student Debates #1</strong>: Cartilage Biology/Pathology (online synchronous)</td>
<td>Beier</td>
</tr>
<tr>
<td>5</td>
<td>Feb 10</td>
<td>Osteoporosis and metabolic bone diseases</td>
<td>Beier / Séguin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disorders of Ectopic ossification</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Feb 17</td>
<td><strong>No Class, Reading Week</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Feb 24</td>
<td><strong>Student Debates #2</strong>: Bone Biology / Pathology (online synchronous)</td>
<td>Beier</td>
</tr>
<tr>
<td>8</td>
<td>Mar 3</td>
<td><strong>Midterm</strong></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Mar 10</td>
<td>Spine Biology and Pathobiology</td>
<td>Séguin</td>
</tr>
<tr>
<td>10</td>
<td>Mar 17</td>
<td><strong>Student Debates #3</strong>: Intervertebral disc biology (online synchronous)</td>
<td>Séguin</td>
</tr>
<tr>
<td>11</td>
<td>Mar 24</td>
<td>Skeletal Regeneration and Tissue Engineering</td>
<td>Séguin</td>
</tr>
<tr>
<td>12</td>
<td>Mar 31</td>
<td><strong>Student Debates #4</strong>: Tissue Engineering (online synchronous)</td>
<td>Séguin</td>
</tr>
<tr>
<td>13</td>
<td>Apr 7</td>
<td>Musculoskeletal Mechanobiology</td>
<td>Séguin</td>
</tr>
</tbody>
</table>
7. Online Participation & Engagement

- Students are expected to participate and engage with content as much as possible
- Students can participate during debate sessions or post on OWL after watching the recordings
- Students can also participate by interacting in the OWL forums with their peers and instructors

8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Format</th>
<th>Weighting</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm test</td>
<td>Short and long answer</td>
<td>30%</td>
<td>Mar 3</td>
</tr>
<tr>
<td>Online quizzes</td>
<td>Short answer</td>
<td>15%</td>
<td>throughout term</td>
</tr>
<tr>
<td>Debate presentations</td>
<td>Oral presentation</td>
<td>15%</td>
<td>throughout term</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Short and long answer</td>
<td>40%</td>
<td>Apr 14-30</td>
</tr>
</tbody>
</table>

The midterm test and final exam will consist of short answer questions based on lecture materials, any information posted on OWL, and any assigned readings as well as one long-answer essay format question. The final exam is cumulative, but with emphasis on the material taught after the midterm.

Online quizzes will be posted on OWL following each debate, and remain active for 1 week. Questions will be based on the debate papers, including relevant methodologies, results, and overall discussion of the debate topic. Quizzes are designed to be open book, but must be completed by each student individually. Quiz answers will be graded as submitted written assignments and assessed for textual similarity. Detection of plagiarism will result in a grade of 0.

The structure and objectives of the in-class debates are posted on OWL. In the case of a student absence on the day of their schedule debate presentation, students will be expected to prepare a 3-4 page (~1,500 word) “News and Views” style report on the 2 assigned scientific journal papers (i.e. both sides of the debate). Examples of such “News and Views” reports can be found at: https://www.nature.com/nature/articles?type=news-and-views&year=2019. This “make-up” assignment will be due 1 week after schedule debate presentation.

- All assignments are due at 11:55 pm EST unless otherwise specified
- Written assignments will be submitted to Turnitin (policy below)
- Rubrics will be used to evaluate assessments and will be posted with the instructions
- After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days

Click here for a comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.
Information about late or missed evaluations:

- Late assessments without a self-reported absence or documentation to academic counselling will be subject to a late penalty of 5% per day
- Late assessments with a self-reported absence should be submitted within 24 hours of submission of the self-report
- An assessment cannot be submitted after it has been returned to the class; an alternate assessment will be assigned OR the weight will be transferred to the final exam
- A single make-up test will be offered OR the weight of a missed test will be transferred to the final exam
- If a make-up assessment is missed, the student will receive an INC and complete the task the next time the course is offered

9. Communication:

- Students should check the OWL site every 24 – 48 hours
- A weekly update will be provided on the OWL announcements
- Emails will be monitored daily; a response will be sent within 24 – 48 hours
- This course will use the OWL forum for discussions
- Students should post all course-related content on the discussion forum so that everyone can access answers to questions
- The discussion forums will be monitored daily by instructors or TA

10. Office Hours:

- Office hours will be held remotely Zoom
- Students will be able to book an appointment using Sign Up on OWL
- Group office hours may be held, recorded, and posted

11. Resources:

- All resources will be posted in OWL
- No required textbook
- No Required study guide
12. Professionalism and Privacy:

Western students are expected to follow the Student Code of Conduct. The following expectations and professional conduct also apply to this course:

- Students are expected to follow etiquette expectations provided on OWL
- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed
- Students will be expected to take an academic integrity pledge before some assessments

13. How to be Successful in this Class

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Follow weekly checklists on OWL or create your own to help you stay on track.
4. Take notes as you go through the lesson material. Treat this course as you would a face-to-face course. Handwritten notes or even notes in a Word document will help you learn more effectively than just reading or watching the videos.
5. Connect with others. Try forming an online study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).

Western Academic Policies and Statements

Absence from Course Commitments

Policy on Academic Consideration for Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reported absence or via the Academic Counselling unit. Students have two self-reports to use throughout the academic year; absence for course commitments including tests, quizzes, presentations, labs, and assignments that are worth 30% or less can be self-reported. Self-reported absences cover a student for 48 hours (yesterday + today or today + tomorrow). Your instructor will receive notification of your consideration; however, you should contact your instructor immediately regarding your absence. Students are expected to submit missed work within 24
hours of the end of the 48-hour period. Please review details of the university’s policy on academic consideration for student absences.

If you have used both their self-reported absences or will miss more than 48 hours of course requirements, a Student Medical Certificate (SMC) should be signed by a licensed medical or mental health practitioner and you should contact academic counselling. Academic Counselling will be operating virtually this year and can be contacted at scibmsac@uwo.ca.

Accommodation for Religious Holidays

The policy on Accommodation for Religious Holidays can be viewed here.

Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found here.

Academic Offenses

“Scholastic offences are taken seriously, and students are directed here to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review The policy on Accommodation for Students with Disabilities.

Correspondence Statement

The centrally administered e-mail account provided to students will be considered the individual’s official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts here.

Turnitin and other similarity review software

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com.
BMSUE Academic Policies and Statements

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Rounding of Marks Statement

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final grades on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

Support Services

The following links provide information about support services at Western University.

- Academic Counselling (Science and Basic Medical Sciences)
- Appeal Procedures
- Registrarial Services
- Student Development Services
- Student Health Services