KINE 4449 ADVANCED HUMAN PHYSIOLOGY: THE RESPIRATORY SYSTEM IN HEALTH AND DISEASES

FACULTY OF HEALTH
KINESIOLOGY AND HEALTH SCIENCE

COURSE: HH/KINE4449 - Advanced human physiology: the respiratory system in health and diseases

Course Webpage: https://eclass.yorku.ca/course/view.php?id=87262

Term: Winter Term 2023

Prerequisite / Co-requisite: HH/KINE 3013.

Course Instructor

Emilie Roudier, PhD
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Course consultation hours: Thursday, 13-15 pm

Time and Location

Lectures	TR 10:00	
	Tuesdays	DB 0007
	Thursdays	VH 3009

Course overview.

This course guides the students through advanced concepts in respiratory physiology. The course discusses the structure, function, and regulation of the respiratory system during physiological stresses and in the context of chronic diseases through the analysis of molecular and integrative physiology approaches.

Expanded Course Description

This course will analyse the structure, function, and regulation of the respiratory system. We will discuss how the external and internal environment (e.g., hypoxia) can challenge the homeostasis of the respiratory system. A study of the resultant compensatory physiological mechanisms that restore homeostasis in this context will be performed. Finally, students will analyse how chronic diseases alter function and regulation within the respiratory system.
Students will be exposed to the key concepts of respiratory physiology and the physiological regulatory mechanisms of the respiratory system. Subsequently, the physiopathology of cardiorespiratory diseases such as Chronic Obstructive Pulmonary Disease (COPD), asthma and pulmonary hypertension will be explored. Additionally, students will examine the effects of

chronic or acute cardio-metabolic diseases on the respiratory system (e.g., pulmonary embolism and pulmonary oedema). Upon completion of the course students will better understand the determinants of respiratory health. This course will use current experimental evidence from molecular and integrative respiratory physiology to:

• Give an indication on how chronic respiratory diseases affect Global Health
• Allow an in depth-analysis of the physiology and pathophysiology of the most common chronic respiratory diseases
• Guide the students through the analyses of key research articles in the field
• Create a website designed to increase the awareness of the general population to chronic respiratory diseases

Course Objectives

Purpose:

This course will expose students to the scientific concepts that distinguish a healthy respiratory system from a diseased respiratory system. Upon completion, students will gain the skills to be able to critically analyse scientific literature related to respiratory system function.

This course also aims to help the students develop written communication skills for knowledge transfer about chronic respiratory diseases from the current scientific literature.

Specific learning outcomes of the course

Upon successful completion of the course students will be able to:

• Discuss the molecular, cellular, and physiological mechanisms that regulate the respiratory system
• Describe how environmental factors can challenge the homeostasis of the respiratory system
• Describe how chronic diseases alter the respiratory system
• Describe the impact of respiratory diseases on the respiratory system.
• Develop the ability to effectively communicate scientific knowledge to the general public through a webpage

Course Text / Readings

Most of the course topics were adapted from chapters of the textbook by John B. West "Pulmonary physiology and pathophysiology: An integrated, Case-based approach. 2nd edition. ISBN-13: 978-0-7817-06701-9." Topics were updated using more recent scientific publications in the topic. The topic related to COVID-19 is fully based on scientific publications.

Required reading: Scientific reading (research or review articles) will be available on E-class to support learning objectives and evaluation of students.

Suggested Textbook: Topics of the course are based on some chapters of the book "Pulmonary Physiology and Pathophysiology: An integrated, case-based approach. Second edition by John B. West. Wolters Kluwer | Lippincott Williams & Wilkins. https://www.lww.co.uk/9780781767019/pulmonary-physiology-and-pathophysiology/

E-class will host:

- course outline
- slides from the lectures that are usually available at least one day before the lecture
- any other material for the course (links to readings, multimedia)
- any announcements about the course

Evaluation:

Assessment (e.g. test, assignment, Exam)	% of total grade	Total Marks (Eg. Graded out of 30 marks)	Due Date (MM/DD/YYYY)	Date Grade Returned to Student (MM/DD/YYYY)
In-class examination 1	21	21	February 16th, 2023	March 2nd, 2023
In-class examination 2	19	19	April 6th,2023	April 17th, 2023
Reading responses	24	24	January 29th, 2023 March 5th, 2023	February 13th, 2023 March 20th, 2023
Participation: 8 for participation on forum or in-class 4 for participation to group work	12 (8 + 4)	12 (8 + 4)	Through the course	Participation will be tracked on Final participation mark on April 6th, 2023
Creating a webpage	24	24	March 24th, 2023	April 7th, 2023
	100			

This course requirements and weights are final and will not to be modified throughout the term

- In-class examination 1 and 2: Students will answer 3-6 questions about the course material or a provided article. Questions will be mainly a sequence of short answers around themes discussed in class or online.
- Online reading response: Students will have to answer a series of questions about a required reading.
- Participation to activities: Instructor will design in-class activities it can be guided reading in-group or individual, performing a task (e.g., searching database or website) students will be participate in-class or online in forum
- Creating a webpage: Students will work both individually and in-group. Each student will have to create a webpage or pretend to create a webpage. While students will work within groups, the evaluation will be individual. Within a group each student will tackle a given topic related to respiratory system in health and disease. Each topic should be complementary to the topics of the other group members. Once the webpages of each group members are collected, they should represent a coherent, appealing, and interesting website for the public to gain knowledge about the respiratory system in health and disease.

TENTATIVE LECTURE SCHEDULE

This schedule is a tentative one, that might be subjected to change depending on the tempo of lectures, students' learning pace and time required to provide guidance and feedback for students 'evaluation.

Week	Date (estimated)	
1-4	01/09/2023-02/02/2023	Topics: • Description of course (course outline, topics, and evaluation) • Topic1: Normal pulmonary physiology: Exercise and the respiratory system (Part 1) Required readings: • Bates et al "Overbuilt for exercise or not: how do lung structure and distensibility impact exercise capacity?" http://onlinelibrary.wiley.com.ezproxy.library.yorku.ca/doi/10.1113/jphysiol.2012.248393/full • Hopkins et al. "Pulmonary transit time and diffusion limitation during heavy exercise in athletes" http://onlinelibrary.wiley.com.ezproxy.library.yorku.ca/doi/10.1113/jphysiol.2012.248393/full • Additional readings might be required from the textbook or articles as indicated by the instructor
Reading response 1 is due January 29th, 2023		
4-7	02/07/2023-03/09/2023	Topic 2: • Normal pulmonary physiology: Exercise and the pulmonary system (part 2) • Review midterm • Midterm examination 1 is February 16th, 2023 • Normal pulmonary physiology: Hypoxia and the pulmonary system (part 2), continues… Required readings: • Petersson J, Glenny RW. Gas exchange and ventilation-perfusion relationships in the lung. Eur Respir J. 2014 Oct;44(4):1023-41. doi: 10.1183/09031936.00037014. Epub 2014 Jul 25. https://erj-ersjournals-com.ezproxy.library.yorku.ca/content/44/4/1023.long • John West. 2000. "Human Limits for Hypoxia: The Physiological Challenge of Climbing Mt. Everest." http://onlinelibrary.wiley.com.ezproxy.library.yorku.ca/doi/10.1111/j.1749-6632.2000.tb06173.x/full
Reading response 2 is due March 5th, 2023		

8-10	03/09/2023 - 03/27/2020	Lecture Topic 3: • Pathological pulmonary physiology: Chronic Obstructive Pulmonary Disease (COPD) and Asthma Required readings: • Van de Moortele et al. 2017. "Airway morphology and inspiratory flow features in the early stages of Chronic Obstructive Pulmonary Disease." http://www.sciencedirect.com.ezproxy.library.yorku.ca/science/article/pii/S0268003317302863?via%3Dihub#f0015 • Carson et al. 2013. "Physical activity for asthma." http://onlinelibrary.wiley.com.ezproxy.library.yorku.ca/doi/10.1002/14651858.CD001116.pub4/full • Additional readings might be required from the textbook or articles as indicated by the instructor Optional reading: • Yamauchi et al 2012. "Dynamic change in respiratory resistance during inspiratory and expiratory phases of tidal breathing in patients with chronic obstructive pulmonary disease."https://www-ncbi-nlm-nih-gov.ezproxy.library.yorku.ca/pmc/articles/PMC3346211/
		Website is due March 24th, 2023
10-12	03/27/2023 –04/06/2023	Topics: • Topic 4: acute respiratory distress syndrome, the example of COVID-19 • Review mid-term examination 2 Required readings: • Additional readings might be required from the textbook or articles as indicated by the instructor. May include COVID-19 Acute Respiratory Distress Syndrome - Critical Care Clinics (theclinics.com) or Morphological and functional findings in COVID-19 lung disease as compared to Pneumonia, ARDS, and High-Altitude Pulmonary Edema - ScienceDirect
		Examination 2 is April 6th, 2023

Referencing Style: The referencing style approved by the course director is the Vancouver style. York University Libraries provide manuals. Please see http://michener.ca/students/library/referencing-writing-help/vancouverstyle/

Time commitment:

Description of the components of the course	Time to dedicate
Review of material	~30 min / week
Reading of additional material provided online (E-class)	~80-100 min / week
Preparation of the assignment (~20 hours total)	~100-120 min / week

Total of study-time outside the classroom	210-350 min /week

You will be expected to attach an Assignment Attachment Form to each assignment and essay submitted (see attached form).

ACADEMIC HONESTY AND INTEGRITY

In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.) to aiding and abetting (helping someone else to cheat). All breaches in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on Academic Honesty.

To promote academic integrity in this course, students will be normally required to submit their written assignments to Turnitin (via the course E-Class) for a review of textual similarity and the detection of possible plagiarism. In so doing, students will allow their material to be included as source documents in the Turnitin.com reference database, where they will be used only for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin service are described on the Turnitin.com website.

WRITING AND LEARNING SKILLS

You are strongly encouraged to seek assistance from the following university units.

1. Writing Centre Welcome to the Writing Centre - The Faculty of LA&PS (yorku.ca)
2. Learning Commons (yorku.ca)
3. Learning Skills Services - Student Community & Leadership Development (yorku.ca)

Colleges can provide further support to KAHS students. See the information below regarding the Calumet and strong colleges' student success programming:

Calumet and Stong Colleges aim to support the success of Faculty of Health students through a variety of free programs throughout their university career:

- Orientation helps new students transition into university, discover campus resources, and establish social and academic networks.
- Peer Mentoring connects well-trained upper-year students with first year and transfer students to help them transition into university.
- Course Representative Program supports the academic success and resourcefulness of students in core program courses through in-class announcements.
- Peer-Assisted Study Sessions (PASS) involve upper-level academically successful and well-trained students who facilitate study sessions in courses that are historically challenging.
- Peer Tutoring offers one-on-one academic support by well-trained Peer Tutors.
- Please connect with your Course Director about any specific academic resources for this class.
- Calumet and Stong Colleges also support students' Health & Wellness, leadership and professional skills development, student/community engagement and wellbeing, Career Exploration, Indigenous Circle, awards and recognition, and provide opportunities to students to work or volunteer.
- For additional resources/information about Calumet and Stong Colleges' Student Success Programs, please consult our websites (Calumet College; Stong College), email scchelp@yorku.ca, and/or follow us on Instagram (Calumet College; Stong College), Facebook (Calumet College; Stong College) and LinkedIn.
- Are you receiving our weekly email (Subject: "Calumet and Stong Colleges - Upcoming

events")? If not, please check your Inbox and Junk folders, and if it's not there then please contact ccscadmn@yorku.ca, and request to be added to the listserv. Also, make sure to add your 'preferred email' to your Passport York personal profile to make sure you receive important news and information.

Grading, Assignment Submission, Lateness Penalties and Missed Tests

Grading: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ - 7, C+ = 5, etc.). Assignments and tests* will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.). (For a full description of York grading system see the York University Undergraduate Calendar - Programs | 2022-23 Undergraduate Academic Calendar | York University

Students may take a limited number of courses for degree credit on an ungraded (pass/fail) basis. For full information on this option see Alternative Grading Option in the *Faculty of Health* section of the Undergraduate Calendar: https://registrar.yorku.ca/grades/legends/health

Assignment Submission: Proper academic performance depends on students doing their work not only well, but on time. Accordingly, assignments for this course must be received on the due date specified for the assignment (deadlines are specified in the course outline or in E-class). Accordingly, assignments for this course must be received on the due date specified for the assignment. Assignments are to be handed online on E-class, instructions for submission will be described in both the in-person sessions and in E-class. The instructor will also make announcements on E-class to inform students regarding submission process when appropriate. Forums will close at the time and dates indicated on E-class. Deadlines of assignments will also appear on E-class assignments.

Lateness Penalty: Assignments received later than the due date will be penalized (**penalized 0.5 % per day of delay.** For example, if an assignment worth 19%, the instructor will apply -0.5% for each day of delay. Assignments submitted 5 business days after the deadline will not be considered. Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., may be entertained by the Course Instructor but will require supporting documentation (e.g., a doctor's letter).

Missed Tests: Students with a documented reason for missing a course test, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation may request accommodation from the Course Instructor. Accommodation includes that the instructor will set up make up deferred examinations in the case of a missed in-class examination or new deadline for the submission of the assignment. Further extensions or accommodation will require students to submit a formal petition to the Faculty of Health.

ADDITIONAL INFORMATION

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (see Reports, Initiatives, Documents) - https://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust2012-.pdf

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
  - Religious Observance Accommodation

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- For additional resources/information about Calumet and Stong Colleges' Student Success Programs, please consult our websites (Calumet College; Stong College), email scchelp@yorku.ca, and/or follow us on Instagram (Calumet College; Stong College), Facebook (Calumet College; Stong College) and LinkedIn.
- Are you receiving our weekly email (Subject: "Calumet and Stong Colleges - Upcoming events")? If not, please check your Inbox and Junk folders, and if it's not there then please contact ccscadmn@yorku.ca, and request to be added to the listserv. Also, make sure to add your 'preferred email' to your Passport York personal profile to make sure you receive important news and information.