



BIOM*4050 Biomedical Aspects of Aging

Winter 2022

Section(s): 01

Department of Biomedical Sciences

Credit Weight: 0.50

Version 1.00 - January 04, 2022

1 Course Details

1.1 Calendar Description

Aging is accompanied by alterations in the physiological and biochemical functioning of body organ systems. The relationship between aging and the cardiovascular, respiratory, digestion/nutrition and reproductive systems will be discussed as will homeostatic functions associated with bone metabolism and fluid balance.

Pre-Requisites:

1 of BIOM*3200, HK*3810, HK*3940

Restrictions:

This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department of Biomedical Sciences website for more information.

1.2 Timetable

Class schedule: Tuesday & Thursday 10:00 AM -11:20 AM

In-person (when permitted): Rozanski Hall Room 102 Note: in-person lectures will not be recorded.

Remote semester start (synchronous): via ZOOM.

1.3 Final Exam

The final exam in this course has been schedule for April 20, 2022; 11:30 AM to 1:30 PM.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Dr. Pawel Bartlewski
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2.2 Teaching Assistants

Teaching Assistant (GTA): Andrila Collins
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Teaching Assistant (GTA): Julia Pfeifer
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3 Learning Resources

4 Learning Outcomes

The overall aim of this course is to introduce aspects of physiology, cell biology, genetics and biochemistry as they occur in cells, tissues and body organ systems in the aging human subject. Students are expected to gain an understanding of the alterations in biological functioning based on principles learned in earlier courses. Developing a critical attitude to the proposed theories of aging is an integral part of the course. The learning objectives are to foster independent learning, emphasize problem solving and to integrate information from varying disciplines.

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Integrate knowledge of basic physiology, biochemistry and cellular biology to an applied area, biomedical aspects of aging, which is of practical significance in today's society.
 2. Research specific biomedical topics in aging and present findings to colleagues in a clear, concise and scientific manner using a variety of approaches.
 3. Compose different types of scientific writing, e.g. short scientific articles, assignments and short essay type answers.
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5 Teaching and Learning Activities

Class schedule:

In-person (when permitted):

Tuesday & Thursday 10:00 AM -11:20 AM; Rozanski Hall Room 102 Note: in-person lectures will not be recorded.

Remote semester start (synchronous):

Lectures and student presentations will take place Tuesday and Thursday 10:00 to 11:20 via ZOOM.

5.1 Lecture

Tue, Jan 11

Topics: Introduction and Course Information

Thu, Jan 13

Topics: Measures and Biomarkers

Tue, Jan 18

Topics: Non-genetic Causes of Aging

Thu, Jan 20

Topics: Cellular Senescence

Tue, Jan 25

Topics: Cardiovascular System

Thu, Jan 27

Topics: Seminars – Cardiovascular/Respiratory System

Tue, Feb 1

Topics: Nervous System

Thu, Feb 3

Topics: Seminars – Nervous System

Tue, Feb 8

Topics: Glucocorticoids and Stress

Thu, Feb 10

Topics: Seminars – Special Senses/ Sleep Disorders

Tue, Feb 15

Topics: Urinary System

Thu, Feb 17

Topics: Video – Rage Against the Darkness

Mon, Feb 21 - Fri, Feb 25

Topics: Monday February 21st to Friday February 25th – Winter break

Tue, Mar 1

Topics: Reproductive System (Dr. Bartlewski)

Thu, Mar 3

Topics: Seminars – Digestive/Urinary/Endocrine

Tue, Mar 8

Topics: Wound Healing and Regeneration (Dr. Vickaryous)

Thu, Mar 10

Topics:	Seminars – Integument/Skeletal System
Tue, Mar 15	
Topics:	Genetics and Aging
Thu, Mar 17	
Topics:	Seminars – Genetics/Nutrition/ Environment
Tue, Mar 22	
Topics:	Pharmacology
Thu, Mar 24	
Topics:	Poster Presentations - Aging Issues
Tue, Mar 29	
Topics:	Poster Presentations - Aging Issues
Thu, Mar 31	
Topics:	Poster Presentations - Aging Issues
Tue, Apr 5	
Topics:	Longevity and Society/Exam Review
Thu, Apr 7	
Topics:	No Lecture Scheduled: Class Time to Work on Final Reflection

6 Assessments

There are **four assignments** and a **final exam** scheduled during the semester. These assessments are worth 95 % of your final grade in the course. In addition, 5 % of your final grade will be based on the completion of peer assessments of seminar sessions and poster presentations.

Instructions and marking rubrics for each assignment and details on peer assessments and late penalties for assignments will be posted on CourseLink.

As part of the ongoing efforts to maintain academic integrity at the University of Guelph, this course will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying.

6.1 Assessment Details

Assignment 1: Reflections on Aging (15%)

The purpose of this assignment is for you to reflect on your personal view of aging. This assignment is divided into two parts. The first involves reflecting on how your past personal experiences shape your view of aging. The second final reflection connects the content of this course with your personal reflection from the start of the semester.

Part 1 is worth 10 % of your final grade and is **due** by 11:59 PM on **Friday January 21, 2022**.

Part 2 is worth 5 % of your final grade and is **due** by 11:59 PM on **Friday April 8, 2022**.

No minimum or maximum length is required for either part of this assignment – as a guideline 500 to 1000 words. Additional details will be provided on CourseLink.

Assignment 2: Student Seminars (15%)

Involves students working in groups of five, preparing and presenting to the class a PowerPoint seminar on an aging topic (see table below for suggestions).

These talks will be presented during designated classes as mini-symposia based on aging themes. When necessary, two sessions will be run on each day in two separate class rooms. A maximum of three groups will present in each session. Seminars should be 20 minutes in length followed by a 5-minute question period. **Each presentation must incorporate recent (last five years) primary research results from journal publications.**

1. **15%** of your final mark (including a within group assessment)
2. An electronic file of the seminar will be submitted prior to the presentation for peer review through the PEAR system (details to be provided on CourseLink).
3. Details on presentation dates and how to sign up for seminars will be posted on CourseLink.
4. **Seminar themes: 1-Cardiovascular/Respiratory; 2-Nervous System; 3-Special Senses/Sleep Disorders; 4-Digestive/Urinary/Endocrine; 5-Integument/Skeletal; 6-Genetics/Environment. Potential Topics:**

Topics are classified under general headings so that each group of presentations has a "theme" thus providing some cohesion to the symposium session.

Cardiovascular/Respiratory System	Nervous System Disorders
Aneurysms	Alzheimer's diseases
Angina	Parkinson's disease
Arrhythmias	Vascular dementia
Hypotension	Other Dementias
Hypertension	Stroke
Myocardial infarction	Progressive supranuclear palsy
Congestive heart failure	Amyotrophic lateral sclerosis
Lung changes – alterations in pO ₂	Huntington's disease
Chronic obstructive pulmonary disease/emphysema	Adult onset sporadic ataxia
Respiratory infections in the elderly (bacterial, influenza)	Traumatic brain injury in the elderly
	Depression
	Anxiety

Integument / Skeletal System	Special Senses/ Sleep Disorders
Skin aging / wrinkles	Hearing loss
Hair growth/loss	Vision impairment (any one of: cataracts; glaucoma; macular degeneration)
Osteoporosis	Taste/smell
Arthritis	Sleep apnea
Sarcopenia (muscle loss)	Insomnia
Skeletal system and balance	Circadian rhythms
Digestive/Urinary/Endocrine System	Genetics/Nutrition/Environment
Swallowing / aging esophagus	Mitochondrial DNA mutations
Stomach ulcers / gallstones	Epigenetics
Type II diabetes	Specific genes involved in aging
Hormone replacement therapy	Antioxidant micronutrients
Thermoregulation	Caloric restriction
Aging neuroendocrine axis	Artificial environments
Incontinence	Barker hypothesis
	Pesticides and Parkinsonism
	Malnutrition and alcoholism

You can choose a topic not indicated in the above list. However, you should discuss your proposed topic choice with an instructor or TA before progressing.

Assignment 3: Problem based learning (PBL). “ Rage Against the Darkness”. Aging and Quality of Life Program (15%)

Elderly individuals often suffer from interacting physical, social and psychological conditions – both acute and chronic – that limit their independence and threaten their capacity to function in daily life.

1. From the documentary "Rage Against the Darkness", identify one age-related disability and produce a patient report consisting of three parts. The initial section of the report should briefly describe the physiology behind the condition and the second part, its social and psychological effects/impact on the individual. In the final section of the report suggest treatment options (medical, environmental, and/or behavioural), with justification(s), that may improve the patient's quality of life.
2. Class time to view the video has been scheduled on February 17th and the patient report is **due Monday, March 14, 2022.**

Assignment 4: Issues Affecting Aging Individuals (15%)

Involves students working in groups of five, preparing and presenting to the class a poster presentation describing an important issue affecting aging individuals and suggestions for addressing the issue selected.

Poster presentation

1. Scientific posters will be presented during the last two weeks in March.
2. This assignment is worth **15%** of your final grade (including an assessment by group members)
3. A copy of the poster must be uploaded to the PEAR system prior to the presentation for peer evaluations (details to be provided on Courselink).
4. **Posters:** A poster is a visual display of information intended to catch and hold the attention of the observer long enough to implant a significant idea in the mind. The poster sessions provide a forum for the exchange of scientific information on an aging subject. Posters can be produced using various computer programs (eg. PowerPoint, Adobe Illustrator) - PowerPoint templates will be available on CourseLink.

Final Examination (35%)

Date: Wed, Apr 20, 11:30 AM - , 1:30 PM, TBD

The examination will consist of completing multiple essay questions (5 to 10 marks each) based on material covered in lectures and student seminars. Additional details will be

provided on CourseLink. The location of the final examination will be scheduled and the exam supervised by the Registrar's Office. Please see WebAdvisor for the latest information.

Peer Assessments (5%)

Students are expected to complete peer-feedback forms on days when they are not presenting. To receive full marks, each student must review 2 seminars and 3 poster presentations. Details for completing peer reviews will be posted on CourseLink.

7 Course Statements

7.1 Course Website

For course information, learning materials, assessment dates, and grades, please consult the course website (accessible via CourseLink). Instructors will aim to post learning materials on CourseLink by 7 PM the evening before each scheduled learning activity. In-person lectures will not be recorded. Lectures presented remotely will be recorded and be posted by 4 PM on the day of the lecture.

7.2 Netiquette

Online Behaviour

Inappropriate online behaviour will be referred to the office of the Associate Dean (Students and Academic) for investigation. The range of possible penalties is listed in the Undergraduate Calendar, Section VIII: Undergraduate Degree Regulations and Procedures, Academic Misconduct, Penalties, Part A: Range of Penalties That May Be Assessed, which includes loss of marks, loss of university scholarships or bursaries, suspension or expulsion from the university, and other penalties, depending on the offence.

Examples of inappropriate online behaviour include:

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online

- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your user name and password
- Recording lectures without the permission of the instructor

7.3 Course Evaluations

Students will be asked to complete an online questionnaire about the course during the last two weeks of classes. This is part of the information required by the University to evaluate faculty performance for purposes of Tenure, Promotion and Selective Increases.

Administered by a third party rather than the instructors, these evaluations will be delivered to the respective instructors ONLY after the final grades have been submitted to the Registrar's Office. Note: only the numerical ratings from the form will be made available to the Chair for administrative purposes - the Chair will NOT see any comments that are written on the evaluation forms unless signed by the student.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic

integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

8.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

8.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
