

## **Biology 4355F - The Biology of Aging: Cellular and Molecular Aspects**

**Instructor: Robert Cumming, BGS 3078**

**Office Hours:** Fridays 3-5 pm

**Lecture Room;** WSC-240, Tuesday, Thursday 11:30-12:30

From the moment we are born we start the process of dying. Every living organism faces the inevitable fate of aging. Humans have long questioned what is aging, why does it happen and how does it occur? Aging is an extremely complex multifactorial process that is governed by genetic, epigenetic and environmental factors. Multiple theories abound but no single universal theory fully explains the aging process. This course will examine concepts on aging primarily from a cellular and molecular perspective.

**Bio 4355F will explore current topics in aging research including:**

- 1) Evolutionary theories on aging
- 2) Model organisms to study aging
- 3) Longevity variation among different species
- 4) The role of reactive oxygen species and apoptosis in aging
- 5) The anti-aging effects of caloric restriction
- 6) Signalling pathways that affect aging
- 7) DNA and protein damage during aging
- 8) Age-associated diseases
- 9) Identification of “aging genes”
- 10) Can aging be slowed or reversed?

The course consists of 2 lectures every week for 12 weeks. Students will write a review on a current scientific article and a short research proposal on a topic related to aging. This course has no assigned textbook. Lecture notes and relevant material will be posted on WebCT.

### **Evaluation:**

Midterm Exam:	25%
Article Review:	10%
Research Proposal:	25%
Class Participation:	10%
Final Exam:	30%

**Prerequisites:** Biology 3316A and enrolment in year 4 of an Honors Specialization module offered through the Department of Biology.

Completion of one of the following courses is recommended: Biology 3595A, Biology 3597B, Biology 3338A, Biology 3592A.

**Student Absences Due to Illness**

Students who are unable to meet a course requirement through any form of illness (whether temporary, serious, or long-term) should advise the instructor of such an absence at the earliest possible opportunity (preferably in advance of the course requirement). Medical excuse slips are not always required. However, the instructor may, at his discretion, require medical certificates for verification of absence for reasons of illness, especially in the event that such absence includes a significant assessment period or evaluation. In the event that a medical excuse slip is requested, a student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services.