

# **ECE 601: FOUNDATIONS OF BIOLOGY IN ENGINEERING**

**Fall 2020**

## **Course Description and Aims**

This biomedical engineering core course focuses on equipping students with the foundational knowledge in human biology through a problem-solving oriented treatment of biological phenomena at the human physiology level. The overarching aim of this course is to develop students' literacy in human biology and to show them how various physiological phenomena can be analytically explained and justified with numbers.

ECE 601 serves well as a physiology bridging course for engineering science students with undergraduate-level math skills but have limited or no prior knowledge of human physiology. It also serves as an engineering bridging course for biology students who previously learned human physiology from a qualitative perspective but have limited or no prior exposure to quantitative analysis.

## **Teaching Staff**

Alfred C. H. Yu  
Professor, Electrical and Computer Engineering  
E-mail: [alfred.yu@uwaterloo.ca](mailto:alfred.yu@uwaterloo.ca)  
Ext: 36908  
Office: XXXXXXXXXX

## **Course Learning Outcomes**

By the end of this course students should be able to demonstrate a threshold level of mastery of the following learning outcomes:

1. Describe foundational biology principles at the human physiology level
2. Identify various factors that regulate physiological operations
3. Explain human physiology concepts from a quantitative analysis perspective

## **Course Prerequisites**

For engineering science students: Background in undergraduate-level circuit analysis (ECE 140 and 240, or equivalent) is preferred.

For biology students: Prior completion of one undergraduate physiology course (BIOL 273, or equivalent) is preferred.

## **Grade Breakdown**

In-Class Exercises (30%)  
Assignments (70%)

## **Textbook**

Costanzo. *Physiology*. 6<sup>th</sup> Ed. Elsevier, 2018.