

Cardiology (BIOM4180/BIOM6610)

Winter 2021

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Lectures: Tuesday and Thursday, 8:30-9:50 am (Section 01) and 4:00-5:20 pm (Section 02)

Course Objective: This advanced pathophysiology course focuses on the molecular basis for cardiac function and disease. Students are expected to gain an appreciation for the molecular and cellular mechanisms that allow the heart to function normally, and understand how alterations in these processes contribute to disease. The course is roughly divided into 3 units:

1. **Molecular Cardiology:** the molecular events that drive normal heart function will be presented, with some discussion of conditions that impact specific processes.
2. **Clinical Cardiology:** commonly used clinical tools (eg. echocardiography and electrocardiography) will be presented. Students will learn the fundamental principles of these techniques, their clinical uses, and will gain some appreciation for their use in diagnosing cardiac abnormalities.
3. **Altered Cardiac Physiology:** The impact of physiological and pathological stressors will be examined, and the impact of these stressors on the molecular systems outlined in Unit 1 will be addressed.

Student Evaluation: Performance throughout the course is evaluated with a variety of assignments that allow students to present factually correct and evidence-based information in a creative format. Assessment of performance will include evaluations of content, creativity, and clarity of presentation.

1. Animated Slides. Using the content from the first unit as a guide, students will create a short PowerPoint-style presentation that teaches a molecular cardiology concept. The presentation will be recorded and submitted as a video (mpg4 format). Alternative options include stop motion animation or other animation styles. ***Students may not simply videotape themselves delivering a presentation.*** The maximum duration of the presentation is 2 minutes. The intended audience is future students who take BIOM4180.

In addition to the short recording, students should separately include a write-up of no more than 200 words that 1. explains the learning objective of the presentation, and 2. Is a summary of key points or concepts that the student should understand after viewing the slides.

2. Infographic and Instagram Post. The second unit will focus on clinical tools and their use in diagnosing disease. For the second assignment, each student will create a 1-page infographic on a health condition (eg. heart attack, heart failure, second degree AV block, etc) or altered physiological state (eg. pregnancy, exercise training, etc). The infographic should explain the condition (definition, statistics, etc) and include ***at least one clinical tool*** that is used in the diagnosis or identification of the subject. The clinical tools or tests need not be confined to ones used in class.

Along with the Infographic, each student will submit a short written explanation of the condition, along with relevant points that explain the content of the infographic. The written summary must fit the guidelines for posting to Instagram: no more than 2,200 characters, including up to 30 hashtags.

The infographic must fit on one page and should be suitable for posting to Instagram as a photo. The image may be constructed using any software, but must be submitted as a jpeg. The written summary must conform to Instagram guidelines which have a limit of 2,200 characters. Hashtags are encouraged to increase visibility of the post.

The use of copyrighted photos can only be done with written permission of the rights holders. Students are responsible for obtaining this permission **before** submission. Failure to do so will result in a grade of 0. In many cases fair use allows the inclusion of images on infographics that are presented for educational use. All points must be cited in the infographic and the Instagram post. Citations included in the Instagram post (including the reference list) will not count towards the character limit.

3. Twitter. Students are expected to sign-up for a Twitter account if they do not have one, or would prefer to use a dedicated account for this class. Once the account is established they can follow the course instructor (@glenpyle) and other members of the class. There is no requirement to follow any person (including course instructor) and grades will not be awarded or deducted based on who students choose to follow.

Each student is responsible for posting their twitter name on Courselink (Discussions Lists > Twitter > Twitter Names) by Friday, January 22, 2020. Failure to post a twitter name along with given names on Courselink will result in a maximum grade of '50%' for the Twitter assignment. During the semester students will 'tweet' a minimum of 12 news stories or research articles on topics related to cardiology or cardiac research (10% of final grade). Only tweets which are composed by the student (i.e. not simply a retweet) will count towards the 12 required posts. Use the hashtag '#biom4180' to mark tweets for the course (along with other hashtags as appropriate). Tweets not marked with #biom4180 will not be considered for grading. Tweeting the minimal number of stories or articles will earn a maximum grade of 50%. Additional grades are awarded for quality of communication, originality, additional original tweets, and interactions with others (including retweets, discussions, etc). Any tweets posted after April 2 will not be considered for grading.

4. Blog Writing Assignment. Once during the semester each student will select an original research article. The topic and a link to the research article must be posted on Courselink (Discussions Lists > Blog > Blog Post Topics). The first student to post the topic and article (link) on Courselink claims that topic (determined by the time stamp on Courselink). The student will then write a blog posting on the topic (maximum 1,000 words, not including references or in-text citations).

Each submitted topic and article must be unique. It is the responsibility of each student to ensure their subject and article is unique. If a repeat topic is chosen, the blog submission will be rejected and must be resubmitted. If the resubmission occurs after the deadline late penalties will be applied (10% deduction per day, including weekends).

Review articles or non-peer reviewed references can only be used for general concepts or population statistics, and all references should be from reputable sources. The use of questionable references will result in a lower grade. Citations should be in-text and can be of any format, but they must be consistently used throughout the article.

The article should be written at a level that is generally understandable for a high school student with no advanced science training. The blog should summarize the findings of the original research article and how it relates to the findings of other studies. This is a critical analysis of the study and an explanation of its significance. Students should avoid personalizing the blog and presenting it in the first person: it should be an unbiased presentation of material.

Background information should be provided to facilitate understanding the material in the blog. Once the blog is reviewed and deemed by the instructor to be suitable for posting, the instructor will post the entry to the class blog (<https://bestcardiologyclasssever.wordpress.com/>) or other external sources. Postings will contain the student's name unless they wish to remain anonymous (choosing to exclude the student's name from posting will not impact the grade).

Grading Considerations

1. Grade Weighting. The 3 main assignments (PowerPoint Presentation, Instagram/Infographic, Blog) are each worth 30%. If a passing grade is received for all assignments and all assignments are handed in on time, the assignments will be automatically reweighted at the end of the semester. The highest assignment will be given 35% weight, the 2nd highest 30%, and the lowest 25%. Students should not request reweighing of their assignments or ask for a failed assignment to be waived to allow for reweighing.

2. Optional Tweetorial. Students who would like an opportunity to reduce the proportional weight given to the 3 major assignments can choose to complete an optional tweetorial on an original research paper (review articles are not permitted). The paper must be different from the one chosen for their blog (both in terms of the specific article and the subject focus).

Using a maximum of 8 tweets linked in a single thread, the student will explain the findings of the paper, including the rationale/problem, general approach, results, and significance. The article that is the focus of the tweetorial must have been published on or after September 1, 2020. The tweetorial should not be posted until after grading, but it must fit within the character limits of Twitter. Failure to meet the posting requirements will result in a lower grade. The Tweetorial can use images and figures from the paper or outside sources to illustrate points. The text must be novel and copying from the article is considered academic misconduct.

If a tweetorial is submitted, this will comprise 10% of the overall grade, and will be deducted from the total of the major assignments (PowerPoint, Instagram, Blog = 80%, Twitter = 10%, Tweetorial = 10%). Reweighting of major assignments will be 31%/27%/22%, to make up 80% of the final grade.

Students who wish to complete this optional assignment must submit their tweetorial by April 2. If the optional tweetorial is submitted, the grade must be included in the final overall grade calculation, even if it negatively impacts the overall grade.

Late Assignments. Assignments handed in after the posted deadline will be penalized 10% per day, including weekends. All deadlines are 11:59:59 pm on the day indicated.

Assessment	Date	Percent of Grade
PowerPoint Presentation	February 12	30%
Instagram	March 12	30%
Blog	April 2	30%
Twitter	April 2	10%

Textbooks: There is no textbook for this course. At the bottom of all lecture slides are relevant references that students are encouraged to consult if they seek further information.

Course and Instructor Evaluation: Students will be asked to complete a questionnaire on instructors' teaching competence during the last two weeks of classes. This is part of information required by the University of Guelph 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. Only comments that are signed will be considered in course or instructor evaluations.

Academic Misconduct: The University of Guelph takes a very serious view of Academic Misconduct. Included in this category are such activities as cheating on examinations, plagiarism, misrepresentation, and submitting the same material in two different courses without written permission. Students are expected to be familiar with

the section on Academic Misconduct in the Undergraduate Calendar and should be aware that expulsion from the University is a possible penalty. The course has a zero tolerance policy for Academic Misconduct. At a minimum Academic Misconduct will result in a grade of '0' for the assignment and is at the discretion of the course instructor

Schedule of Topics

Lecture Title	Date
Course Introduction	January 12
Cardiac Valves	January 14
Action Potentials	January 19
Calcium Entry	January 21
Calcium Removal	January 26
Cardiac Myofilaments	January 28
Q&A Session	February 2
No lecture	February 4
ECG Theory	February 9
ECG Abnormalities – Part I	February 11
Reading Week (no class)	February 16
Reading Week (no class)	February 18
ECG Abnormalities – Part II	February 23
Echocardiography	February 25
Q&A Session	March 2
No lecture	March 4
Heart Failure – Part I	March 9
Heart Failure – Part II	March 11
Acute Myocardial Infarctions	March 16
A Patient's Perspective	March 18
Athletics	March 23
Sex and Gender	March 25
Q&A Session	March 30
No lecture	April 1