



LAND ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

COURSE INFORMATION

| Course Title | Course Code Number | Credit Value |
|--|--------------------|--------------|
| Biochemistry & Society: Current Issues | BIOC470 | 3 |

PREREQUISITES

BIOC302 or BIOC303

COREQUISITES

None

COURSE LOCATION AND TIME

| Day | Time | Location |
|-----------------|-------------|-----------|
| Monday & Friday | 3:00-5:00pm | HEBB B112 |

INSTRUCTORS AND TEACHING ASSISTANTS

| Instructor | Contact Details |
|-----------------------------|--|
| Dr Lindsay Rogers (she/her) | lindsay.rogers@ubc.ca |



| Teaching Assistant | Contact Details |
|-------------------------------|--|
| Kaicheng Ma | makaiche@mail.ubc.ca |
| Madelaine Robertson (she/her) | madelaine.robertson@msl.ubc.ca |
| Matthew Lynn (he/him) | lynnmatt@student.ubc.ca |
| Prunveer Palia | prunveer.palia@ubc.ca |

COURSE DESCRIPTION

This course will discuss select global issues using a Biochemistry and Molecular Biology lens. The structure will consist of lectures, class discussions, and problem-based learning where students will work through real-world case studies in small groups. Students will also select a societal issue to critique using a molecular perspective and communicate their findings through a written article or video recording. This course is intended for students who would like to practice evidence-based analysis, communicate science, and engage in public dialog.

LEARNING OBJECTIVES

The overall objective of this course is to use fundamental science to critically evaluate societal challenges. Select topics will be presented where a molecular understanding identifies a risk, describes the scale of a challenge, or presents a possible solution. Students will learn to discuss science, form evidence-based opinions and, in many cases, critique existing policy.

This course aims to:

- promote critical evaluation of scientific literature and ideas
- integrate scientific knowledge
- improve communication skills
- address global challenges from a basic science perspective

CLASS STRUCTURE

| Time | Activity |
|-------------|------------------------|
| 3:00-3:30pm | Lecture |
| 3:30-4:00pm | Class Discussion |
| 4:00-5:00pm | Problem-Based Learning |

Lectures

Pre-recorded lectures will be posted on Canvas before the scheduled lecture date and time. Each lecture is 25-30min. Students are responsible for watching lectures before each class discussion and problem-based learning tutorial.

**Class Discussion**

A class discussion lead by the course instructor is scheduled every class before problem-based learning. Within an informal setting, the discussion will review the previous lecture and tutorial and also introduce new ideas and content.

Problem-Based Learning

Problem-based learning (PBL) is a learning method designed to promote critical thinking and encourage students to apply concepts covered during lecture. A major goal of PBL is to learn to effectively communicate ideas and collaborate with your peers. Students will be assigned to small groups of approximately 7 students. Groups will work through a series of real-world case studies.

COURSE SCHEDULE

| Dates | Topic |
|---------------------------|------------------------------------|
| Jan 8 & 12 | Introduction |
| Jan 15 & 19 | Persistent Organic Pollutants |
| Jan 22 & 26 | Endocrine-Disrupting Chemicals |
| Jan 29 & Feb 2 | Nitrogen Cycling |
| Feb 5 & 9 | Carbon Cycling |
| Feb 12 & 16 | Genetic Engineering |
| Feb 19 & 23 | Midterm Break (no classes) |
| Feb 26 & Mar 1 | Gene Therapy |
| Mar 4 & 8 | GM Food |
| Mar 11 & 15 | Antibiotic Resistance |
| Mar 18 | Scientific Writing |
| Mar 22 | Silent Genomes Project |
| Mar 25 | Vaccines |
| Mar 29 & Apr 1 | Easter Holiday (no classes) |
| Apr 5 | Poster Presentations |
| Apr 8 | Poster Presentations |
| Apr 12 | Poster Presentations |

COURSE MATERIALS

For all information pertaining to BIOC470, please refer to the course website (<https://faculty.canvas.ubc.ca/>). On the website you will find details regarding assignments and assessment criteria, supplemental reading lists, lectures, and case studies for problem-based learning.

IMPORTANT DATES AND DEADLINES

- **Assignment Proposal** – Due February 19 at 11:59pm
- **Poster Presentation** – refer to presentation schedule
- **Peer Assessment** – April 12 at 11:59pm
- **Final Assignment** – April 14 at 11:59pm



COURSE EVALUATION

| Component | Grade Weight |
|------------------------|--------------|
| Problem-Based Learning | 30% |
| Peer & Self-Assessment | 10% |
| Quizzes | 10% |
| Assignment Proposal | 10% |
| Poster Presentation | 10% |
| Final Assignment | 30% |

Problem-Based Learning

Students will be graded based on preparation, effective collaboration with peers, and their proficiency in communicating scientific ideas. Students are expected to prepare for PBL by watching pre-recorded lectures which will be posted on Canvas. Students will receive a midterm and end of term grade for PBL, each with comments from their teaching assistant.

Peer and Self-Assessment

Students will be graded based on performance during problem-based learning and contributions to class discussions. Each student will submit a self-assessment at the end of term. Each student will also be assessed by members of their problem-based learning group. The final grade will be calculated as the average across all peer assessments submitted by group members. Individual students will not receive a grade until they have submitted a self-assessment and a peer assessment for each member of their problem-based learning group.

Quizzes

Each week students are expected to complete a two-question quiz within Canvas. Quiz questions are multiple choice and relate to material covered within the pre-recorded lectures and during class discussions. Quizzes will open Monday at 9:00am and close Sunday at 11:59pm each week.

Assignment Proposal

Students will select a topic or issue and, using a provided template, propose an outline for their final assignment. Detailed instructions regarding the assignment proposal are provided within a separate document.

Poster Presentation

Students will select a topic or issue, conduct an evidence-based analysis, and communicate their findings through a digital poster. Detailed instructions regarding the poster presentation are provided within a separation document.

Final Assignment

Students will select a societal issue, conduct an evidence-based analysis, and communicate their findings through a video recording or written article. Detailed instructions regarding the final assignment are provided within a separate document.

LATE SUBMISSION POLICY

The deadlines for the assignments and assignment proposal and poster presentation are fixed. Extensions for medical reasons and personal hardship are to be directed to the course instructor as soon as possible. For late submissions without an approved extension there will be a penalty of 10% per day.

Students with disabilities and ongoing medical conditions have the option to request an accommodation for course assessments after registering with the Centre for Accessibility. If you are eligible for course accommodations, please contact the course instructor.

ACADEMIC MISCONDUCT

UBC and the Department of Biochemistry and Molecular Biology take the issue of academic misconduct very seriously; the honest assessment of student learning is key to both the success of the university and success for individual students. Cheating, in any form, undermines the value of a degree and can have serious consequences for your continued academic success. As such it is important to know what your responsibilities are, what constitutes academic misconduct and how you can avoid it. With some effort and forethought no student should ever have to find themselves facing discipline for academic misconduct; inform yourself as to the expectations placed on you and what your responsibilities are.

What consequences can arise from academic misconduct?

The severity of the discipline can range from a letter of reprimand or a zero on the assignment in question all the way to expulsion from the University. Perhaps the most common outcome in these cases are grades of zero in the course in which the misconduct occurred.

Information regarding academic integrity, expectations of students, and potential disciplinary measures resulting from academic misconduct at UBC is provided within the links below.

<https://learningcommons.ubc.ca/resource-guides/understand-academic-integrity/>

<https://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959>

<https://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,960>

EQUITY DIVERSITY AND INCLUSION (EDI) POLICIES

Our goal is that students from all diverse backgrounds and perspectives are well-served by this course, that students' learning needs are addressed both in and out of class, and that the diversity students bring to this class is viewed as a resource, strength and benefit. We make a commitment to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. We will foster a climate within the classroom where students of diverse backgrounds and identities feel comfortable sharing their opinions and experience with varied topics throughout the class. We (like many people) are learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable or if you observe a situation where someone else is made to feel uncomfortable, please talk to us about it. This includes concerns about any class-related interactions that lead to feelings of exclusion or marginalization. We welcome and encourage your feedback on how we can better cultivate a sense of inclusion in our course. This can be done through meetings, email or anonymous feedback through Canvas. We aim to do our best to address each situation as it arises and effect meaningful



changes moving forward. For more information follow the link below to our departmental EDI website.

<https://biochem.ubc.ca/equity-diversity-inclusion/>

STUDENT RESOURCES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate Website.

<https://senate.ubc.ca/policies-resources-support-student-success/>

Mental Health Resources

In case you are struggling with mental health, or are feeling stressed or anxious, UBC Counselling Services provides information about a number of resources available to students. Additionally, UBC students receive mental health coverage of up to \$1500 under the AMS Health & Dental Plan. Here2Talk is available for BC post-secondary students to talk with trained counsellors 24/7 (via voice call or text messages). If you are a student living in UBC residence, Counsellors in Residence can also be a valuable resource to provide mental health support. If you have a UBC email address, Therapy Assistance Online (TAO) is a free online resource that provides tools to manage stress, relationship problems, substance use, etc.

<https://students.ubc.ca/health/counselling-services>

<https://vancouver.housing.ubc.ca/counsellor-in-residence/>

COVID RELATED POLICIES

For UBC's latest response to COVID-19, please visit covid19.ubc.ca. During in-person meetings for this course, it is important that everyone feels as comfortable as possible engaging in class activities while sharing an indoor space. Non-medical masks that cover our noses and mouths are a primary tool to make it harder for COVID-19 to find a new host. The higher the rate of vaccination in our community overall, the lower the chance of spreading this virus. You are an important part of the UBC community. Please arrange to get vaccinated if you have not already done so. **If you are sick, it is important that you stay home – no matter what you think you may be sick with (i.e. cold, flu, other).**

COPYRIGHT

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the course Instructor(s) or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.



APPENDIX

Evaluation Rubrics

Problem-Based Learning Grading Rubric

| | | | | |
|---|-----------------------------|-------------------|--------------------------|------------------------|
| Student name: | | | | |
| Student number: | | | | |
| X to indicate the extent to which you agree | Strongly Agree (85-100%) | Agree (70-84%) | Weakly Agree (55-69%) | Do Not Agree (<55%) |
| Preparation | | | | |
| Demonstrates a deep understanding of lecture material | | | | |
| Links the case study to weekly learning objectives | | | | |
| Effective collaboration with peers | | | | |
| Abides by ground rules established by the group | | | | |
| Is accountable to the group (punctual, engaged, no devices) | | | | |
| Asks clarifying questions to stimulate discussion | | | | |
| Critically challenges ideas using logic and respect | | | | |
| Facilitates the involvement of all group members | | | | |
| Monitors time and progression through the case | | | | |
| Communicating scientific ideas | | | | |
| Presents evidence-based ideas | | | | |
| Uses correct scientific terminology | | | | |
| Identifies and analyzes potential knowledge gaps | | | | |
| Contributes to group discussions and class discussions | | | | |
| Grade: | | | | |
| Comments: | | | | |



Peer and Self-Assessment Grading Rubric

| | | | | |
|---|-----------------------------|-------------------|--------------------------|------------------------|
| Student Name: | | | | |
| PBL Group Number: | | | | |
| X to indicate the extent to which you agree | Strongly Agree (85-100%) | Agree (70-84%) | Weakly Agree (55-69%) | Do Not Agree (<55%) |
| Peer Evaluation | | | | |
| This group member is prepared, punctual, and actively engages in both problem-based learning discussions and class discussions. | | | | |
| This group member is considerate and respectful of fellow students and actively facilitates collaboration within our group. | | | | |
| This group member communicates science effectively by citing the sources of their information and using correct scientific terminology. | | | | |
| Grade: | | | | |
| Comments | | | | |
| <p>For self-assessment: <i>Something I am proud of this term is ...</i> <i>Something I would like to work towards improving in the future is ...</i></p> <p>For peer assessment: <i>Something positive I would like to share with this group member is ...</i></p> | | | | |



Poster Grading Rubric

| Student name: | | | | |
|--|-----------------------------|-------------------|--------------------------|------------------------|
| Student number: | | | | |
| X to indicate the extent to which you agree | Strongly Agree (85-100%) | Agree (70-84%) | Weakly Agree (55-69%) | Do Not Agree (<55%) |
| Comprehension | | | | |
| The poster clearly conveys the results of the evidence-based analysis. | | | | |
| The poster contains all required components. | | | | |
| All visuals are clearly annotated. | | | | |
| All adapted data and images are referenced. | | | | |
| Visual Appeal | | | | |
| The poster has an attractive layout and design. | | | | |
| All text is large enough to read from a distance of at least 1m. | | | | |
| Presentation | | | | |
| The presenter was welcoming and available throughout the poster session. | | | | |
| The presenter answered all questions professionally and respectfully. | | | | |
| The presenter displayed deep knowledge of the subject matter. | | | | |
| Grade: | | | | |
| Comments: | | | | |



Assignment Grading Rubric

| Student name: | | | | |
|---|-----------------------------|-------------------|--------------------------|------------------------|
| X to indicate the extent to which you agree | Strongly Agree (85-100%) | Agree (70-84%) | Weakly Agree (55-69%) | Do Not Agree (<55%) |
| Topic | | | | |
| The question or opinion is clearly defined. | | | | |
| Presents a significant societal issue from a novel perspective | | | | |
| Background Information | | | | |
| Is sufficient to understand the scale and relevance of the issue presented | | | | |
| Clearly identifies the problem or area of controversy | | | | |
| Biochemistry contributes <u>significantly</u> to the audience's understanding | | | | |
| Evidence-Based Analysis | | | | |
| Presents evidence-based consideration of views and arguments | | | | |
| Arguments are well organized and clearly described | | | | |
| All arguments are supported by peer reviewed literature | | | | |
| Biochemistry contributes <u>significantly</u> to the analysis | | | | |
| Conclusion | | | | |
| Outcomes of the evidence-based analysis are clearly summarized | | | | |
| Existing knowledge gaps are recognized | | | | |
| Recommendations and/or future options are described | | | | |
| Visuals | | | | |
| All visuals help elucidate the aim of the work. | | | | |
| Figures and tables are well annotated and professional | | | | |
| Overall impression | | | | |
| The work is engaging and holds the audience's attention. | | | | |
| The work is of high quality and contains minimal errors. | | | | |
| The work adheres to all formatting requirements. | | | | |
| Grade: | | | | |
| Comments: | | | | |