

# **Bio3316b: Advanced Cell Biology 2021-2022**

## **General Course, Instructor & TA Information**

Instructor: **Dr. Greg Kelly**

Office Location: Western Science Centre (WSC), Room 359, 519-661-3121.

Email: gkelly@uwo.ca

Lecture: Mon. and Wed 11:30-12:30 pm, on Zoom or NCB 114 in-person

Tutorials: Mon. Thurs. and Fridays (see below for time and place).

Office Hours: Mon and Wed 1:30-2:30 pm, or by alternate arrangements.

## **Teaching Assistants:**

### **Danielle Spice**

Email: dspice@uwo.ca Office Location: WSC 355

### **Suleyman Adbullah**

Email; sabdul45@uwo.ca Office Location: WSC 355

### **Celina Valvano**

Email; cvalvanvo@uwo.ca Office Location: WSC 355

### **Nuwanthika Gedara**

Email: nwathuli@uwo.ca Office Location: WSC 355

## **Land Acknowledgement**

We acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. With this, we respect the longstanding relationships that Indigenous Nations have to this land, as they are the original caretakers. We acknowledge historical and ongoing injustices that Indigenous Peoples (First Nations, Métis and Inuit) endure in Canada, and we accept responsibility as a public institution to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research and community service.

Learn more about Indigenous Initiatives at Western: <https://indigenous.uwo.ca/>

## **Equity, Diversity, and Inclusivity Statement**

We will uphold an equitable and inclusive learning environment for all students in this course and we welcome students from all backgrounds, ethnicities, sexual orientations, and genders. This course is a safe learning environment, where any form of discrimination will not be tolerated under any circumstances.

**Note: This class is LIVE and ONLINE until Western administration says otherwise!**

## Prerequisite Requirements

Biochemistry 2280A; Biology 2382A/B

Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

## Senate definition for meaning of letter grades:

- A+: 90-100 One could scarcely expect better from a student at this level
- A: 80-89 Superior work which is clearly above average
- B: 70-79 Good work, meeting all requirements, and eminently satisfactory
- C: 60-69 Competent work, meeting requirements
- D: 50-59 Fair work, minimally acceptable
- F: below 50 Fail

## Course Description

This course focuses on the functional organization and physiology of cells with special reference to cell communication mechanisms, intracellular signaling pathways, cellular membranes, metabolism, cell motility, and cell specializations. The course introduces students to the interpretation of primary literature and discusses current developments in the field of cell biology.

## Course Outcomes

Upon successful completion of this course, students will be able to:

1. Describe and identify the fundamental signaling pathways involved in cell fate and cell proliferation
2. Analyze a given experiment and predict the outcome given the knowledge of cell signaling pathways acquired through lecture
3. Summarize and interpret primary literature in the form of an oral presentation
4. Link together concepts from multiple disciplines, including cell biology, biochemistry, genetics and developmental biology

## Course Materials

Textbook: Lodish et al. Molecular Biology of the Cell, 8<sup>th</sup> Edition or later (recommended).

## Evaluation

*Electronic devices are NOT be allowed during midterms or final examinations.*

Lecture midterm 1, (non-cumulative) - **15%** You can self-report on this midterm and the weight will be transferred onto your final exam, 15+40.

Lecture midterm 2, (non-cumulative) - **25%** You can receive accommodation or self-report and take the scheduled makeup (see below), and if you have self-reported on the makeup, the weight will be transferred to your final exam, 25+40

Tutorial presentation - **15%** **An Essential Requirement of this course, self-reporting is NOT allowed.**

Tutorial participation - **5%** **If you miss a tutorial when you are not presenting you can use your**

self-reporting, but you will be required to attend another section.  
Final cumulative exam - **40%** An Essential Requirement of this course, self-reporting is not allowed.

**Midterms are during lecture times– 50 minutes long.**

Midterm #1 – Date: Jan. 31, 2022; Time: 11:30-12:20; Rooms: TBD or on Gradescope as needed

Midterm #2 – Date: Mar. 7, 2022; Time: 11:30-12:20; Rooms: TBD or on Gradescope as needed

A make-up for the second midterm only will be scheduled as early as possible following the missed midterm. **There will be no make-up for the first evaluation and if self-reporting the 15% will be added to the final exam. If you have not self-reported then appropriate documentation must be approved by the Academic Counselling Office of your home faculty and 15% will be transferred to your final.**

**Lecture Topics and Schedule** (tentative schedule only, topics may change)

Introduction to Cell Signaling pathways
Hydrophobic signaling pathways – Retinoic Acid
GPCRs, light vision, Cre-lox and RTK signaling
EGF signaling, <i>C. elegans</i> vulva differentiation and cell cycle
AKT signaling in cell proliferations and apoptosis
Apoptosis and Ca <sup>2+</sup> signaling
Protein degradation pathways and canonical Wnt signaling
Non-canonical Wnt signaling
Autophagy
mTOR signaling
Hedgehog signaling
Signaling through the primary cilia
Hippo and Notch signaling
Neurodegenerative diseases
Insulin signaling
ROS and redox signaling
Redox signaling in the context of other signaling pathways
Pathogens and their effects on cell signaling pathways

### **Course Website**

Students must check OWL (<https://owl.uwo.ca/portal>) on a regular basis as this is the primary method by which information will be disseminated to the class.

Use the **OWL Forum as the primary way to ask questions regarding lecture material**; TAs will be monitoring the Forum regularly and it is encouraged that other students address questions from their peers.

### **Tutorials & Tutorial Schedule**

Tutorial presentations begin the week of Jan. 31, 2022, for Sections 002 and 004, and the week of Feb. 7, 2022, for Sections 003 and 005. Students may choose to **self-report** for tutorials in

which they are **NOT** presenting, however will be required to attend an alternate tutorial section. **Tutorial presentations are an essential course requirement and as such require academic accommodation and students may NOT self-report.** Your tutorial partners for presentations will be assigned randomly by one of the TAs; assignments will be posted on OWL.

Tutorial Room Assignments:

Section 002 = Mondays, 12:30-2:30, SH-3307 (Celina)

Section 003 = Thursdays, 10:30-12:30, PAB-34 (Danielle)

Section 004 = Fridays, 10:30-12:30, SH-3305 (Nuwanthika)

Section 005 = Fridays, 1:30-3:30, PAB-36 (Suleyman)

Tutorial Schedule:

Tutorial	Week of...	Section
1	Jan. 17, 2022	All sections ONLINE
	Jan. 24, 2022	All sections ONLINE
2	Jan. 31, 2022	002 & 004
	Feb. 7, 2022	003 & 005
3	Feb. 14, 2022	002 & 004
	Feb. 28, 2022	003 & 005
4	Mar. 7, 2022	002 & 004
	Mar. 14, 2022	003 & 005
5	Mar. 21, 2022	002 & 004
	Mar. 28, 2022	003 & 005

Tutorials are held as listed above. You **MUST** attend, and sign in, at the end of each tutorial, in order to be awarded the 5% tutorial participation. **Missing a SINGLE tutorial without self-reporting, without having the approval from the Academic Counselling Office of your home faculty or leaving a tutorial early without proper accommodation will result in a mark of ZERO for the ENTIRE participation mark.**

*@More information on self-reporting can be found on the course (OWL) website.*

Presentation Guidelines:

Students will present in groups of 2, a 15-minute (plus 3 minutes of questions) presentation summarizing, interpreting and critiquing a primary research article discussing a topic in cell biology. In the event of a tutorial having an odd number of students a group of 3 may be assigned where students will be required to present a 22-minute presentation.

Students will send their respective TA a PDF of their chosen research article for approval AT LEAST 7 days prior to the presentation date. Failure to send an article for approval by that time will result in an automatic **5% deduction** from the tutorial presentation. If the TA deems your article not suitable for presentation you will be given 1 additional day per submitted article to produce an additional article without facing the **5% deduction**.

Students who are not presenting are required to participate in the tutorial by asking the presenters questions during the question period and are required to provide the presenters with constructive feedback on their presentation skills through anonymous comment sheets that will be compiled by the TAs and given to presenters at the end of the term.

## **Emailing Policy**

Students are encouraged to use the OWL Forum as their primary way of asking questions related to lecture material. Please use this forum before emailing Dr. Kelly or the TAs a lecture related question.

When students are emailing either Dr. Kelly or the TAs, they must use their UWO email and have Bio3316 followed by the nature of the email in the subject line. When emailing after regular working hours allow 24 hours before expecting a response. Emails sent on a weekend will be answered 24 hours after the next business day. **Any email received where the question can be answered by reading the course outline will not be returned!** Likewise, no emails or forum posts will be addressed 24 hours before any midterm examinations or 48 hours before the final exam.

Inappropriate language on the Forum or in emails will not be tolerated under any circumstances and will be reported.

## **Accommodation and Accessibility**

If you are unable to meet a course requirement due to illness or other circumstance dictated by UWO policy, you can **self-report** (2 times per student per academic year) or if you have previously **self-reported** twice **you must** instead provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140 and can be contacted at

[https://www.uwo.ca/sci/counselling/advising\\_services/counselling\\_hours.html](https://www.uwo.ca/sci/counselling/advising_services/counselling_hours.html)

For further information, please consult the university's medical illness policy at [http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf).

Note that approval of accommodation for any course component worth 10% or more can only be made by the student's Dean's Office/Academic Counselling unit outside of self-reporting.

If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you can. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" ([https://registrar.uwo.ca/academics/examinations/exam\\_conflicts.html](https://registrar.uwo.ca/academics/examinations/exam_conflicts.html)).

## **Academic Policies**

The website for Registrarial Services is <http://www.registrar.uwo.ca>

In accordance with policy, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Phones, tablets, or laptops must be off or switched to Airplane mode during exams. Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)

### **Support Services**

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services at 661-2111 ext. 82147 if you have questions regarding accommodation.

The policy on Accommodation for Students with Disabilities can be found here:

<http://sdc.uwo.ca/ssd/>

The policy on Accommodation for Religious Holidays can be found here:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_religious.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf)

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Wellness Education Centre ([http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://academicsupport.uwo.ca>

### **How to Succeed in this Course**

This course will be challenging to the best of students as it is often the first time interacting with primary research as well as understanding complex concepts at a sub-cellular level. In order to do very well in this course, you **MUST** attend all lectures and you are encouraged to ask questions during the lecture, on the forum and/or to attend office hours if there is anything that is not clear to you.

Try not to think of this course in a linear fashion, there are overlapping concepts between almost all the signaling pathways and diseases we will discuss so try and identify where those connections are to better remember all of the information. Also, do not forget what you have learned from previous courses in genetics, physiology and biochemistry as they are just as relevant in those classes as they are in this one; everything is connected! Finally, be aware of deadlines and expectations, as an example, just showing up to all the tutorials is an easy 5%, don't lose it for being lazy!

**This syllabus will be posted on the OWL website assigned to the course.**