

# Biological Consequences of Global Change

## Syllabus: BIOC58H3 Fall 2019

Course Instructors: Dr. Rachel Sturge, [rachel.sturge@utoronto.ca](mailto:rachel.sturge@utoronto.ca), SW 563B  
Office hours: Mon and Tues 11:10am – 12pm or by appointment  
TA: AJ Masson, [andrew.masson@mail.utoronto.ca](mailto:andrew.masson@mail.utoronto.ca)

Recommended Textbook: Lee Hannah. *Climate Change Biology* 2<sup>nd</sup> edition.

Class meeting time: Lectures Mondays 9 – 11am SW 319  
Tutorials Tut 0001 Tues 9 – 11am SW 128  
Tut 0002 Thus 3 – 5pm HW 215

### 1) Course Description

This class is a lecture and tutorial course that addresses the key environmental factor that will dominate the 21<sup>st</sup> century and life on the planet: Global Climate Change. The course will examine the factors that influence climate, from the formation of the earth to the present time, how human activities are driving current and future change, and how organisms, populations, and ecosystems are and will respond to this change. Finally, it will cover human responses and policies that can permit an adaptive response to this change.

### 2) Learning Outcomes

At the end of this course, students should be able to...

1. Correctly use common biological terms and principles from the study of global climate change.
2. Describe the major factors contributing to both past climates and today's climate.
3. Compare and contrast natural and anthropogenic factors contributing to global climate change, and describe the impact of these changes on various biological systems.
4. Recognize that the climate has changed in the past, and be able to describe how biological systems have responded to those changes. Be able to use this information to predict future trends.
5. Read and interpret scientific literature from the field, and use that literature to synthesize persuasive arguments in both debates and in written form.
6. Explain how studies in the field can help us understand the impacts of climate change and how organisms have responded / continue to respond to these changes.
7. Apply the knowledge used in this course for both understanding and to inform policy in an effort to mitigate the impacts of climate change, both in this course and in your future lives.

### 3) Academic Honesty

All work in this course is covered by the University of Toronto's policies on Academic Misconduct (see below hyperlink), which outlines the behaviours that constitute academic dishonest, as well as the processes for addressing academic offences. The University treats cases of cheating and plagiarism very seriously, so please **REVIEW THIS MATERIAL** as you are expected to be familiar with it.

<http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf>

Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

- Using or possessing unauthorized aids.
- Looking at someone else's answers during an exam or test.
- Misrepresenting your identity.

In academic work:

- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from Dr. Sturge or from other institutional resources (see <http://academicintegrity.utoronto.ca/>).

All students should have confidence in their ability to master this course material and earn an acceptable grade. If you are struggling with the material, please come see me or speak with your Teaching Assistant. You should also consider forming study groups as research has shown that students who participate in study groups earn, on average, higher grades in courses than those who do not.

#### 4) Course Policies

- Come to class on time and be ready to start as soon as class begins.
- Read all material related to that day's lecture / tutorial BEFORE class, and complete any pre-class assignments in advance.
- Ask questions and discuss the material with other students. Group discussion promotes learning.
- Be an active learner and participate fully in all aspects of the course. Hold yourself and your teammates accountable for all tasks assigned to you / them in any group activity. Be honest with yourself if you are not contributing as fully as you should be, and make positive changes, if necessary.
- If using technology, which includes (but is not limited to) cellphones, tablets and computers, please use them responsibly. The human mind is NOT capable of multitasking (as many scientific studies have shown), and distracted learners are not high-achieving learners. I reserve the right to dock points from any students caught using electronic devices for non-class activities, and also to ban them from future use of these devices while in class.

#### 5) Assessment

##### a) Methods of instruction

The basic information of this course will be presented through lectures on major topics, student-led literature reviews of recent articles, and group-based active learning exercises. Class attendance (both lecture and tutorial) is **MANDATORY** and prompt arrival is crucial.

**Students who miss four tutorials will automatically earn a zero for their tutorial grade.**

We will be using iClicker Cloud for lecture participation – please see Quercus for more details. Tutorial participation will be graded based on active participation in tutorials and on arriving to tutorial on time. If you show up late, or you come unprepared or unwilling to participate, you will earn a lower grade.

##### b) Tutorials

We will spend time in tutorial analyzing and discussing scientific papers on topics that relate to each week's lecture. Students are expected to read the assigned paper and come to tutorial prepared to discuss it. In tutorial, students will work in groups of four to answer questions related to that week's article. Groups will then be randomly assigned questions and asked to present their findings to the class as a whole. **At the end of the discussion, students will take a quiz designed to test their understanding of the paper.** Through these discussions, you will learn how to read scientific literature critically, and how to identify both the limits of a study and the general principles that we can draw from it. Reading scientific literature requires understanding the basics of methodology, putting effort into thinking about the research and the results, and critical thinking skills. These readings will supplement the lecture material, and the material from these papers **will be covered on exams.**

In addition to literature discussions, students will participate in active learning and group-based exercises aimed at promoting deeper thinking about the concepts introduced in this course. These exercises may include, but are not limited to, writing assignments, small presentations, debates, worksheets. Students will also work on groups to complete two major projects during the semester: a public service announcement (worth 2% of your final grade) and researching and preparing a write-up for the final debate (worth 3% of your final grade). More details regarding these assignments will be given out as the semester progresses. You will be asked to submit assignments to turnitin.com (see section 6 of this syllabus).

**No makeup tutorials will be permitted.** All students will be allowed to drop their lowest tutorial score (excluding PSA and debate-related tutorials), regardless of the reasons for the missed tutorial. Note this dropped score also includes all university-accepted excused absences (such as illness). If you will miss more than one tutorial for a university-accepted reason, you must contact your TA or myself as soon as possible so we can discuss alternate accommodations. **Note that tutorial attendance is MANDATORY. Students who miss four tutorials will automatically fail the tutorial component, receiving a zero for this portion of their final grade.**

#### **Late penalties**

No late assignments will be accepted for work that is completed in tutorial. For all other assignments, work that is turned in late will be penalized by 10% per day, **starting with 5 minutes after the due date / time**, unless the student provides documented proof of the reason for their tardiness. Illness on the day an assignment is due is **NOT** considered an acceptable excuse for late assignments – plan to email assignments to your TA or your instructor BEFORE the deadline if you are ill on the day they are due.

#### **c) Exams**

There will be a midterm exam worth 25% and a cumulative final exam worth 40% of your final grade. Both exams will be based on lecture material and on the literature discussed during tutorials. Readings supplement the lecture material and are immeasurably helpful in preparing for tests / exams. Both exams will consist of multiple choice, short answer and problem-solving questions. The midterm exam will take place during the scheduled lecture time and final exam will take place during the final exam period.

**Makeup exams** If you miss the midterm due to a university-accepted reason, please contact me within three days of the scheduled exam time and provide documentation to support your absence (see <https://www.utoronto.ca/biosci/missed-term-work-policy> for details on acceptable documentation and how to submit it). **Students with a valid excuse will be given a makeup exam within one week of the missed exam (unless there is a valid reason for a longer delay).** **Students who fail to contact me within three days will earn a score of zero and no makeup exam will be permitted** (note that students who are unable to contact me within this time frame due to circumstances beyond their control are exempt from this.) **Makeup midterm exams will consist solely of ten short answer questions.** If you miss the final exam you must go through the registrar's office to request a deferred exam.

**d) Accessibility**

We welcome students with diverse learning styles and needs at this University and in this course. If you require some sort of accommodation, please see me or contact the AccessAbility Services Office (see below links) as soon as possible. We will work with you to ensure that you are able to meet the course learning objectives successfully. The UTSC AccessAbility Service staff are available by appointment to assess your specific needs, provide referrals, and to arrange appropriate accommodations. All enquiries are confidential.

UTSC AccessAbility: [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca), (416) 287-7560, SW 302

**e) Grading policies**

Students are responsible for all material that is presented in lecture and tutorial. If you miss a class, you are strongly advised to obtain the notes and assignments from another student. Participation in lecture and tutorial will be an important factor in determining borderline grades, so attendance and participation are strongly advised. Please note again that **NO MAKEUP TUTORIALS ARE PERMITTED AND ATTENDANCE IS MANDATORY. Students who miss four tutorials will receive a zero for this component of their final grade.** For more details, please refer to the relevant section of this syllabus.

<b>Category</b>	<b>Percent</b>
Midterm Exam	25%
Participation (lectures and tutorial)	10%
Tutorials ( <b><u>if you miss four tutorials, you will earn 0% here</u></b> )	10%
Reading Quizzes	5%
PSA and PSA Write-up	5%
Debate and Debate Write-up	5%
Final Exam (cumulative, during final exam period)	40%

**Late penalties**

No late assignments will be accepted for work that is completed in lecture or tutorial. For all other assignments, work that is turned in late will be penalized by 10% per day, **starting with 5 minutes after the due date / time**, unless the student provides documented proof of the reason for their tardiness. Illness on the day an assignment is due is **NOT** considered an acceptable excuse for late assignments – plan to email assignments to your TA or your instructor BEFORE the deadline if you are ill on the day they are due.

**Forms required to document missed coursework**

Students miss class or tutorial for a university-accepted reason must provide documentation to support their absence. Note that if you miss course work due to an illness, you can submit a self-declaration of student illness form. This form must be submitted within three days of the missed coursework, and **MAY NOT** be used to excuse yourself from the midterm exam. There is also a limit to the number of times this form may be used. Please see <https://www.utoronto.ca/biosci/missed-term-work-policy> for more details on documentation.

Please note that self-declaration of illness **DOES NOT** remove the requirement of tutorial attendance. **Students who miss four tutorials will receive zero for the tutorial component of their final grade, regardless of the reasons for these absences.** Also note that, even though we will drop your lowest tutorial score, you still need to document all absences for tutorials – if you miss one tutorial that you have properly documented, and a second tutorial for which you have no documentation, this second absence will count as a zero, lowering your tutorial grade.

**One week 'Statue of Limitations'**

All grading questions about exams, homework, quizzes, group exercises, literature reviews, etc. must be addressed within one week of the scores being posted online or handed out in class. **After this time, no changes will be made to existing grades unless there is a calculation error.** Thus, it is essential that you check your grades regularly and contact your TA or instructor within one week if you feel an error has been made or if you are unsure why you lost points.

**6) Turnitin.com**

Some of your tutorial assignments will involve group and individual written work. You are expected to submit a digital copy of these assignments, when instructed to do so, through Quercus where your work will be checked via Turnitin.com. The following statement is included for your information, as per University policy:

*Normally, students will be required to submit their course essays to Turnitin.com for review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.*

You should have only one account for all of your University of Toronto coursework. Note that you do not need to have an account when submitting work through Quercus – it will be checked by turnitin automatically as part of the submission process.

### Schedule of Classes\*

Instructor: Dr. Rachel Sturge (rachel.sturge@utoronto.ca)

Lecture: Monday 09:10-11:00 SW 319

Tutorials: Tuesday 09:10-11:00 SW 128 or Thursdays 15:10-17:00 HW 215

Readings from *Climate Change Biology* 2<sup>nd</sup> edition (recommended text)

Week	Date	Topic	Chapter
1	Sep. 2	<b>NO CLASS OR TUTORIAL THIS WEEK</b>	
2	Sep. 9	Introduction & Evolution of Earth's climate <b>Tutorials start this week</b>	1, 2
3	Sep. 16	Earth's past climates & Human impacts part 1	3, 4
4	Sep. 23	The impacts of human induced climate change part 2	4, 5
5	Sep. 30	Past terrestrial responses to climate change	6
6	Oct. 7	Past aquatic responses to climate change	7, 8
7	Oct. 14	<b>READING WEEK - NO CLASS</b>	
8	Oct. 21	Mass extinctions and the Anthropocene	9
9	Oct. 28	<b>MIDTERM EXAM</b>	
10	Nov. 4	Estimating extinction risk from climate change	12
11	Nov. 11	Ecosystem services and their importance	13
12	Nov. 18	Conservation strategies and protected area planning	14
13	Nov. 25	Managing landscapes and threatened species	15, 16
14	Dec. 2	Policy and actions to find solutions	17 – 20
<b>FINAL EXAM WILL BE HELD DURING EXAM PERIOD</b>			

\* Schedule is subject to change based on inclement weather or other unforeseen circumstances.