**COURSE SYLLABUS**



**BIOL 301.3 COURSE SYLLABUS**

**COURSE TITLE:** Critical Issues in Biology **TERM:** Fall 2021

**COURSE CODE:** BIOL 301 (CRN 82698) **DELIVERY:** Lectures/Tutorials

**COURSE CREDITS:** 3 cu **START DATE:** September 3, 2020

**CLASS SECTION:** 01 **TUT. LOCATION:** NA

**CLASS LOCATION:** 107 Physics **TUT. TIME:** 1:30 – 4:20 p.m.

 (T, W, Th)

**CLASS TIME:** 1:30-4:10 Friday

**WEBSITE**: Further information accessed through Course Tools

**LECTURERS: D.P. Chivers (Coordinator) TUTORIALS: Gillian Murza**

Rm. 120.7 CSRB, 306-966-4419 Rm. TBA, 306-966-4425

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 **J.D. Benson Teaching Assistants:**

Rm. 320.2 CSRB, 306-966-4404 TBA

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**Catalogue Description**

Examines the essential processes and principles of current, topical biological research. The course is designed to enhance the capacity to understand biological concepts, critically evaluate scientific work, develop logical and sound opinions and improve written and oral communication skills.

**Prerequisite(s):** BIOL 120 or BIOL 121; plus 9 credit units BIOL at the 200-level or above; plus one of STAT 245, STAT 246 or PLSC 214.

**Note:** This course is a requirement in the B.Sc. Four Year and Honours programs in Biology and Environmental Biology and for the Certificate in Biological Research; students in these programs should consider taking BIOL 301 as early as possible in their program.

# Learning and teaching Context

In 2020, this course was offered remotely. We plan to run the course in person this year. However, given the uncertainty related to the covid-19 pandemic, we must remain cognizant of the possibility that we will switch to a remote delivery format. The University has mandated that, **effective September 7, every member of the USask community—all students, faculty, and staff—will be required to show proof of at least one dose of a World Health Organization (WHO)-approved COVID-19 vaccine before coming onto our campuses. Proof of a second dose will be required by no later than Oct. 18. Given that the start date of the class preceded Sept 7, we will have our first in class session on Sept 10, 2021**. I will provide you with a video for the introductory lecture scheduled on Sept 3, 2021. Please note that the tutorial in week 6 will occur remotely.

**Important guidelines for this transition term:**

During this transition term it is important that we undertake in-person elements of this class safely. In order to do this the university has developed a set of expectations and safety protocols that all students must adhere to if they are to engage in in-person activity.

Throughout the term:

Protect the pack: Right now, the impact of student choices and activities when not on campus cannot be separated from time spent on campus. In order to “protect the pack”, the university is asking all students who are doing in-person work to be mindful and do whatever possible to lower the risk that you will contract COVID-19 and bring it onto campus.

Know what is required and expected of you: One of the critical lessons learned in dealing with COVID-19 is knowing that situations can change and we must be flexible and ready to adjust our safety protocols. Instead of listing all of the relevant information in your course outline, the university has created a webpage where all up-to-date information around returning to campus is listed. You are responsible for regularly checking the health and safety guidelines https://covid19.usask.ca/about/safety.php#Expectations and knowing what is expected of you throughout the fall term.

Follow all guidance: Students are expected to follow all guidance provided by the University’s Pandemic Recovery/Response Team (PRT), College/Department, professors, lab instructors, TAs, and any other staff member involved in the in-person academic program activities (e.g., Protective Services, Safety Resources).

Key channels of communication: If there is a need for the class to pause meeting in-person for a period of time you will be notified via Canvas. If this occurs, you will be provided with detailed information on what you will need to do in place of the in-person class sessions (e.g., read content posted in Canvas, complete learning activities in Canvas).

**Learning Outcomes**

This course is intended for you to learn about issues of importance that will affect all of our lives, and to develop the tools for rational responses to those issues. The course is designed with both lecture and tutorial components. The tutorials provide a variety of opportunities to practice thinking critically and writing scientifically through feedback received at multiple points as you develop your skills.

**Course Overview**

An ability to think critically is essential for individuals to function effectively in society. Critical thinking allows us to make rational decisions about what to do and what to believe, understand high-level biological concepts, to give you an introduction to critical global issues that will affect the world in your adult lifetime, to stimulate your ability to develop logical opinions, and to improve your written and oral communication skills.

**Class Schedule**

**PART I -** **DR. CHIVERS’ SECTION** (September 5 to October 24, 2021) (50 points out of 100)

**Week 1** (Aug 30 – Sept 3; No tutorial this week)

Lecture 1 – Class introduction - Course schedule; Scope of the course; Policy about assignments and their deadlines.

**Week 2** (Sept 6 – 10; Tutorial held on Tue, Wed and Thurs afternoons this week - Discussion of Protocol Assignment, Tips for Peer Review)

Lecture 2 – The basics of science and critical thinking; Understanding the scientific method.

Lecture 3 – The basics of science and critical thinking; publishing and assessing biases in science – sexism

**Week 3** (Sept 13 - 17; Tutorial held on Tue, Wed and Thurs afternoons this week – Academic Integrity – Paraphrasing & Citation)

Lecture 4 – The basics of science and critical thinking; Muzzling scientists

Lecture 5 – Reading and Writing scientific papers; titles, abstracts and keywords. Introduction to assignment #2 – writing an abstract for a scientific paper

**Week 4** (Sept 20 – 24; Tutorial held on Tue, Wed and Thurs afternoons this week – Abstracts)

Lecture 6 – Scientific writing continued.

Lecture 7 – Statistical inference.

**Week 5** (Sept 27 – Oct 1; No tutorial held this week.)

Lecture 8 – Certainty in science – this lecture will be the basis of your assignment on Certainty in Science

Lecture 9 – Certainty in science continued

**Week 6** (Oct 4 - 8; Tutorial held on Tue, Wed and Thurs afternoons this week – Writing Hacks \* This tutorial will be presented remotely.)

Lecture 10 – *Guest speaker*: DeDe Dawson, Science & Scholarly Communication Librarian – Searching databases; ordering interlibrary loans.

**Week 7** (Oct 11 – 15) There is no required tutorial, however, you must submit a list of three primary research articles on a critical issue of your choice. Dr. Benson and tutorial instructors will be available in an online meeting space (TBA) for consultation.

Lecture 11 (15 Oct) – LECTURE MID-TERM EXAM: 1:30-4:10 pm

**PART 2 - DR. BENSON’S SECTION** (October 18 to December 3, 2021) (50 points out of 100)

**Week 9** (Oct 18 – Oct 22; During the tutorial period, students will meet with Gillian / Dr. Benson to nominate and the topic of their critical issue (identified and studied in a scientific article from the primary literature published within the past 24 months, i.e., September 2019 onward). This topic and paper will be utilized as a subject for assignments consisting of a promotional tweet, a media release, a poster presentation, and the final essay.

 *Due:* *The tweet about your critical issue is to be submitted by 5 pm, Oct 22*.

Lecture 12 *Guest speaker*: TBN University of Saskatchewan Media Relations Specialist -What is a media release and how is it used to share research results? *Introduction to assignment – preparing a media release about your critical issue*.

Lecture 13 Introduction to the other topics in Part 2 of this course, including due dates for items to be evaluated. Analyzing a research paper in order to synthesize a tweet and accurate media release; proper referencing in scientific writing (within text, and end-of-text, citations and citation management software).

**Week 10** (Oct 25 – Oct 29); Tutorial held to practice analyzing a research paper about invasive species and constructing a media release.

*Due 5 pm, Friday Oct 29:* *The first draft media release about your critical issue paper*.

Lecture 14– Invasive species: impact on biodiversity and on the environment.

Lecture 15– Mathematical models of invasive species and COVID-19.

**Week 11** (Nov 1 – 5; Tutorial held to discuss preparation of a poster presentation; *Introduction to assignment – preparing a poster presentation about your critical issue*; Sign-up in tutorial for First Session (Nov 22-26) or Second Session (Nov 30- Dec 4)

 *Due 5 pm Nov 5: Peer reviews of media releases.*

Lecture 16 - Primary and secondary scientific literature; Editorial process leading to a peer-reviewed (refereed) publication.

Lecture 17 – *Guest speaker(s)*: TBN members of the USURJ Editorial Staff – Original scholarly work created by students for publication within the University of Saskatchewan Undergraduate Research Journal (USURJ).

**Week 12** (Nov 8 – 12) **University Study Break (No lectures or tutorials this week)**

**Week 13** (Nov 15-19; No tutorial this week.

*Due: 5 pm Nov 15. First Draft Poster about your critical issue paper.*

*Due: 5 pm Nov 19. Revised Media Release about your critical issue paper*.

*Due*: *5 pm Nov 19. Peer reviews of critical issue posters.*

Lecture 18 – Current issues in research ethics.

 **Week 14** (Nov 22 - 26; Tutorial held on Tue, Wed, and Thurs, for the First Session of Poster Presentations by half of each tutorial-section’s students.

Lecture 19 – Writing a mini-review essay about a selected biological topic; *Introduction to assignment – preparing the essay about your critical issue* during the Final Exam period.

**Week 15** (Nov 29 – Dec 3; Tutorial held on Tue, Wed, and Thurs, for the Second Session of Poster Presentations by half of each tutorial-section’s students.

Lecture 20– Overview of the second half of the course.

**Midterm and Final Examination Scheduling**

The midterm must be written on the date scheduled. If a student is unable to write an exam through no fault of his or her own for medical or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be given.  Students are encouraged to review all examination policies and procedures:

# <http://students.usask.ca/academics/exams.php>

# Length and Mode of Final Examination

*For this course, a final essay is due on Dec. 10 in lieu of a final exam*. Details of this assigned essay will be shared in class.

**Required Resources**

**Required Book:**

Victoria McMillan. *Writing Papers in the Biological Sciences* (6th ed, published in 2017)

Textbooks are available from the University of Saskatchewan Bookstore: <https://bookstore.usask.ca/students.php#MyTextbooks>

**Other Required Materials**

**Electronic Resources**

All lectures and some additional course material such as scientific papers, will be shared on the course Canvas website.

Grading Scheme

**OVERALL EVALUATION (Total = 100%) – All components listed are required course work:**

 **Part 1**

* Protocol (Due date: Sept. 17) 7%
* Abstract (Due date: Oct. 1) 8%
* Scientific Certainty essay (Due date: Oct 15) 15%
* Midterm Exam (written in the class period on Oct 15) 20%

 **Part 2**

* Tweet about critical issue paper (Due date: Oct 22) 2%
* First draft of media release about critical issue paper (Due date:Oct 29) 2%
* Peer review completion for media release (Due date: Nov 5) 3%
* Revised media release about critical issue paper (Due date: Nov 19) 4%
* First draft of poster about critical issue paper (Due date: Nov 15) 2%
* Peer review completion for poster (Due date: Nov 19) 3%
* Poster presentation about critical issue paper (Nov 22-26, Nov 29-Dec 3) 8%
* Essay/Mini review article about critical issue (Due date: Dec. 10) 26%

Evaluation Components

**Assignment 1: Protocol**

**Value**: 7% of final grade

**Due Date**: Sept 17, 2020

**Type**: Written assignment that emphasizes the ability to follow specific directions and clearly and concisely summary information. This assignment will help the course instructors identify any students that may require additional writing supports.

**Description**: Clear, concise writing is a critical skill for any scientists. You are to write a protocol, or a "how to" document, on an activity of your choice. The assignment will be 650-850 words and will follow specific formatting instructions.

**Assignment 2: Abstract**

**Value**: 8% of final grade

**Due Date**: October 1, 2020

**Type**: Written assignment that consists of an abstract for a scientific paper. Given that most scientists read hundreds of abstracts for each paper they read, learning to write abstracts is a critical skill for professional biologists.

**Description**: Students will write an abstract (250 words), along with a title and key words, of a scientific paper that is supplied by Professor Chivers. The style of the abstract must follow that outlined in class.

**Assignment 3: Scientific Certainty Essay**

**Value**: 15% of final grade

**Due Date**: October 15, 2020

**Type**: Written assignment in which you assess your certainty that a specific hypothesis presented to you is true.

**Description**: The scientific method allows scientist to draw conclusions yet when presented with the same data, individuals often differ in how certain they are that a conclusion is correct. In this 900-1200 words essay you will explore your certainty of a hypothesis being true and any differences in certainty that arises between you and members of the class.

**Midterm Exam**

**Value**: 20% of final grade

**Date**: Oct 15, 2020

**Length:** 3 hours

**Type**: Comprehensive exam for the first half of the course.

**Description**: Essay exam (1 question) that examines your understanding of the scientific method. The essay question will be emailed to you at the start of the lecture period on Oct 16th and must be emailed back to Professor Chivers by 4:30 that day. All students must work alone.

**Assignment 4: Critical Issue Tweet**

**Value**: 2% of final grade

**Due Date**: See Course Schedule

**Type**: Tweet in MS Document format, or other approved document. Tweets are an important tool for scientists and universities to share research results. They also require distillation of complex ideas into very short communications.

**Description**: Using a tweet generator compose and submit a (fake or real) tweet summarizing and promoting the results of your approved paper.

**Assignment 5: First Draft of Media Release**

**Value**: 2% of final grade

**Due Date**: See Course Schedule

**Type**: Media release document---MS Word format. Media releases are an important tool for scientists and universities to share research results. They also require distillation of complex ideas into short communications.

**Description**: Compose a media release for your approved paper. Must have all elements of a media release, as outlined during lecture and tutorial.

**Assignment 6: Peer Reviews of Media Release**

**Value**: 3% of final grade

**Due Date**: See Course Schedule

**Type**: Peer review of two media releases provided by instructor.

**Description**: Provide a constructive peer review of two media releases. Must comment on all elements of media release, as well as grammar and structure.

**Assignment 6: Revised Media Release**

**Value**: 4% of final grade

**Due Date**: See Course Schedule

**Type**: Media release document---MS Word format. Media releases are an important tool for scientists and universities to share research results. They also require distillation of complex ideas into short communications.

**Description**: Using feedback from peer reviews, revise your media release for your approved paper. Must have all elements of a media release, as outlined during lecture and tutorial.

**Assignment 6: First Draft of Poster**

**Value**: 2% of final grade

**Due Date**: See Course Schedule

**Type**: Digital poster document---MS PowerPoint format. Scientific Posters are an important tool for scientists to share research results. They also require distillation of complex ideas into short communications.

**Description**: Construct a scientific poster for your approved paper. Must have all elements of a scientific poster as outlined during lecture and tutorial.

**Assignment 7: Peer Reviews of Poster**

**Value**: 3% of final grade

**Due Date**: See Course Schedule

**Type**: Peer review of two scientific posters provided by instructor.

**Description**: Provide a constructive peer review of two posters. Must comment on all elements of posters, as well as grammar and design.

**Assignment 8: Poster Presentation**

**Value**: 8% of final grade

**Due Date**: See Course Schedule

**Type**: Oral presentation of digital poster document---MS PowerPoint format. Scientific Posters and their associated guided presentations are an important tool for scientists to share research results. They also require distillation of complex ideas into short communications.

**Description**: Using feedback from peer reviews, revise the scientific poster for your approved paper. Must have all elements of a scientific poster as outlined during lecture and tutorial. Then present your poster one-on-one in 4 minute synchronous online meeting. 50% marks will be given to poster design and content, 40% marks to the oral presentation of material where marks will be given for clarity, timeliness, scientific accuracy, and 10% marks for demonstrating clear understanding of material by answering questions.

**Assignment 9: Critical Issue Essay**

**Value**: 26% of final grade

**Date**: See Course Schedule

**Type**: Written essay in MS Word format showing the relevance of the current issue to biology and the world.

**Description**: 1200 word essay on your critical issue incorporating detailed analysis of the approved scientific paper and its placement in the scope of other literature associated with the critical issue. Use at least 4 total citations. Additional details and rubric will be shared in class.

Submitting Assignments

All assignments will be submitted through Canvas and will be due at the specific date and time indicated.

**Late Assignments**

All assignments are due by the on the day and time indicated in the syllabus. Late assignments (including those turned in after class on the same day) will be penalized 20 percent per day (including weekends). Extensions are only granted in extraordinary circumstances (notably as a result of family or medical emergencies) and upon receipt of adequate documentation. It is your responsibility to contact an instructor prior to the due date/exam if possible or as soon after the due date if it was unfeasible to do so before hand.

**Attendance Expectations**

Attendance is required for synchronous tutorial sessions. Each absence beyond the first tutorial session will result in 5% deduction from the overall course marks. Absences will be excused up to the instructors discretion.

**Experiential Learning**

There are no experiential learning portions of this course

**Recommended Technology for Remote Learning**

Course lectures and interactive features will be offered through Canvas.

Students are reminded of the importance of having the appropriate technology for remote learning. The list of recommendations can be found at <https://students.usask.ca/remote-learning/tech-requirements.php>.

**Recording of the Course**

**Use of video and recording of the course:**

Video conference sessions in this course, including your participation, will be recorded and made available only to students in the course for viewing via Canvas/Blackboard after each session. This is done, in part, to ensure that students unable to join the session (due to, for example, issues with their internet connection) can view the session at a later time. This will also provide you the opportunity to review any material discussed.

Please remember that course recordings belong to your instructor, the University, and/or others (like a guest lecturer) depending on the circumstance of each session, and are protected by copyright. Do not download, copy, or share recordings without the explicit permission of the instructor.

For questions about recording and use of sessions in which you have participated, including any concerns related to your privacy, please contact your instructor. More information on class recordings can be found in the Academic Courses Policy <https://policies.usask.ca/policies/academic-affairs/academic-courses.php#5ClassRecordings>.

**Required video use:**

At times in this course you will be required to have your video on during video conferencing sessions. It will be necessary for you to have use of a webcam built into or connected to your computer. For questions about use of video in your sessions, including those related to your privacy, contact your instructor.

**Copyright**

Course materials are provided to you based on your registration in a class, and anything created by your professors and instructors is their intellectual property, unless materials are designated as open education resources. This includes exams, PowerPoint/PDF slides and other course notes. Additionally, other copyright-protected materials created by textbook publishers and authors may be provided to you based on license terms and educational exceptions in the Canadian Copyright Act (see [http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html)](http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html).

**Before you copy or distribute others’ copyright-protected materials, please ensure that your use of the materials is covered under the University’s Fair Dealing Copyright Guidelines available at**[**https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php**](https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php).For example, posting others’ copyright-protected materials on the open web is not covered under the University’s Fair Dealing Copyright Guidelines, and doing so requires permission from the copyright holder.

For more information about copyright, please visit <https://library.usask.ca/copyright/index.php>where there is information for students available at <https://library.usask.ca/copyright/students/rights.php>, or contact the University’s Copyright Coordinator at mailto:copyright.coordinator@usask.ca or 306-966-8817.

**Integrity**

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty.  Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect.  Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence.  Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php>) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php#IXXIIAPPEALS>)

For more information on what academic integrity means for students see the Academic Integrity section of the University Library Website at: <https://library.usask.ca/academic-integrity#AboutAcademicIntegrity>

You are encouraged to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community - <https://library.usask.ca/academic-integrity.php#AcademicIntegrityTutorial>

**Access and Equity Services (AES) for Students**

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals at any time. Those students who are registered with AES with mental health disabilities and who anticipate that they may have responses to certain course materials or topics, should discuss course content with their instructors prior to course add / drop dates. In order to access AES programs and supports, students must follow AES policy and procedures. For more information or advice, visit <https://students.usask.ca/health/centres/access-equity-services.php>, or contact AES at 306-966-7273 or aes@usask.ca.

Students registered with AES may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

For information on AES services and remote learning please visit <https://updates.usask.ca/info/current/accessibility.php#AccessandEquityServices>

**Student Supports**

**Academic Help for Students**

The University Library offers a range of learning and academic support to assist USask undergrad and graduate students. For information on specific services, please see the Learning page on the Library web site <https://library.usask.ca/support/learning.php>.

* Remote learning support information <https://students.usask.ca/study/remote-learning.php>
* Remote learning tutorial <https://libguides.usask.ca/remote_learning>
* Study skills materials for online learning <https://libguides.usask.ca/studyskills>
* A guide on netiquette, principles to guide respectful online learning interactions <https://teaching.usask.ca/remote-teaching/netiquette.php>

**Teaching, Learning and Student Experience**

Teaching, Learning and Student Experience (TLSE) provides developmental and support services and programs to students and the university community. For more information, see the students’ web site <http://students.usask.ca>.

**College Supports**

Students in Arts & Science are encouraged to contact the Undergraduate Student Office and/or the Trish Monture Centre for Success with any questions on how to choose a major; understand program requirements; choose courses; develop strategies to improve grades; understand university policies and procedures; overcome personal barriers; initiate pre-career inquiries; and identify career planning resources. Contact information is available at: (<http://artsandscience.usask.ca/undergraduate/advising/>)

**Financial Support**

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central (<https://students.usask.ca/student-central.php>).

**Aboriginal Students’ Centre**

The Aboriginal Students’ Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, brining Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC’s Facebook page (<https://www.facebook.com/aboriginalstudentscentre/>) to learn more.

**International Student and Study Abroad Centre**

The International Student and Study Abroad Centre (ISSAC) supports student success and facilitates international education experiences at USask and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students in their transition to the University of Saskatchewan and to life in Canada. ISSAC offers advising and support on matters that affect international students and their families and on matters related to studying abroad as University of Saskatchewan students. Please visit [students.usask.ca](http://students.usask.ca/) or [updates.usask.ca](https://updates.usask.ca/) for more information.

**Treaty Acknowledgement**

As we engage in Remote Teaching and Learning, I would like to acknowledge that the Saskatoon campus of the University of Saskatchewan is on ***Treaty Six Territory*** and the ***Homeland of the Métis***. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. I would also like to recognize that some may be attending this course from other traditional Indigenous lands. I ask that you take a moment to make your own Land Acknowledgement to the peoples of those lands. In doing so, we are actively participating in reconciliation as we navigate our time in this course, learning and supporting each other.