



# BIOM\*4300 Biomedical Communications - DRAFT

Fall 2021

Section(s): 01

Department of Biomedical Sciences

Credit Weight: 0.50

Version 1.00 - September 24, 2021

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## 1 Course Details

### 1.1 Calendar Description

The primary purpose of this course is to develop students' ability to communicate scientific information logically and concisely, in written and oral formats. Students will be taught the basic principles underlying logical development of scientific arguments and hypotheses. Using practical examples drawn from current scientific literature, students will be exposed to the methods currently used by scientists in researching their subjects and writing about them in an effective fashion. Through written and oral presentation assignments, students will develop the skills necessary to confidently develop scientific presentations and communicate their knowledge and ideas to others.

**Pre-Requisites:**

14.00 credits including BIOL\*1080, STAT\*2040

**Restrictions:**

Restricted to students in BSCH:BIOM.

### 1.2 Course Description

The aims of this course are:

(1) to assist students in developing clear, concise and logical approaches to biomedical communications.

(2) to enhance students' writing abilities, both in the translation of complex scientific language to lay terms that can be understood by the general public and in discussing research results in a clear and concise fashion.

(3) to develop students' ability to collect scientific information and synthesize it into coherent short oral presentations

The course is divided into units, an introductory unit that will fill approximately the first three weeks of the course, followed by other units which will run for varying periods of time throughout the remainder of the semester. Because exercises in various forms of communication could easily become fragmented and unsatisfying if they drew at random from different scientific fields, the majority of the course, after the initial introductory section, is framed around a single subject that is not systematically examined in any other course in the Biomedical Sciences Curriculum: Personalized Medicine. The majority of the individual assignments, student presentations, discussions and the final student debate will all be based on material drawn from this subject.

### 1.3 Timetable

MacKinnon Building (MACK) Room **117**

Mon-Wed-Fri 10:30-11:20am

### 1.4 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

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## 2 Instructional Support

### 2.1 Instructional Support Team

<b>Instructor:</b>	Neil MacLusky Ph.D.
<b>Email:</b>	nmaclusk@uoguelph.ca
<b>Telephone:</b>	+1-519-824-4120 x54073
<b>Office:</b>	OVC 1668
<b>Office Hours:</b>	Tuesday 2-5 pm

### 2.2 Teaching Assistants

**Teaching Assistant (GTA):** Simran Bhullar  
**Email:** bhullars@uoguelph.ca

**Teaching Assistant (GTA):** Nicholas Werry  
**Email:** nwerry@uoguelph.ca

**Teaching Assistant (GTA):** Jinane Saboune  
**Email:** jsaboune@uoguelph.ca

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## 3 Learning Resources

### 3.1 Recommended Resources

**University of Guelph Writing Assistance Resources (Website)**

<http://www.lib.uoguelph.ca/get-assistance/writing/book-appointments>

**Understanding Plagiarism and Academic Integrity (Website)**

<http://www.academicintegrity.uoguelph.ca/>

**What is Plagiarism? (Website)**

<http://www.academicintegrity.uoguelph.ca/plagiarism>

**Annotated Bibliographies (Website)**

<http://www.lib.uoguelph.ca/get-assistance/writing/specific-types-papers/writing-annotated-bibliography>

**Booth V. Communicating in science: writing a scientific paper and speaking at scientific meetings. Cambridge England; New York: Cambridge University Press, 1993. (Other)**

**Day RA. Scientific English: a guide for scientists and other professionals. Phoenix, AZ: Oryx Press, 1992. (Other)**

**Day RA, netLibrary I. How to write & publish a scientific paper. Phoenix, Az: Oryx Press, 1998. (Other)**

**Gilpin AA, Patchet-Golubev P. A guide to writing in the sciences. Toronto: University of Toronto Press, 2000. (Other)**

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## 4 Learning Outcomes

### **Rationale for the course:**

Communications skills are reported by employers to be the qualities they most desire in potential job applicants. The ability to communicate information and ideas to others is

fundamental to every branch of science. In medicine, the communication skills of physicians have repeatedly been demonstrated to correlate with patient satisfaction and clinical outcomes, while training of medical students in a communications-oriented curriculum has been shown to significantly improve their success in clinical board examinations<sup>1</sup>. Clinical residents in training are required to regularly present clinical case studies to the rest of the department, as well as to actively participate in the teaching of undergraduate medical students. As a result, professional schools are increasingly using measures of communication ability as an integral component of their evaluation processes for potential students. Yet, little or no attention is paid in most B.Sc. programs to development of this particular skill set.

Unfortunately, communication skills do not come naturally, nor can they be learned by simply reading about the subject. They require development, with the opportunity for practice and feedback, before students can feel truly comfortable expressing themselves orally and in writing, in logical, clear and concise terms. The aim of this course is to provide students entering the third or fourth year of their B.Sc. degrees with instruction on the development of effective scientific communication skills. The skills learned in this course will be of value in the other fourth year courses given in the Bio-medical Science B.Sc., the majority of which now utilize independent learning projects, written assignments and class presentations, as methods of assessment. They will also help students in preparing for their post-graduate careers.

1. Yedidia MJ, Gillespie CC, Kachur E, Schwartz MD, Ockene J, Chepaitis AE, Snyder CW, Lazare A and Lipkin M Jr. Effect of communications training on medical student performance. *Journal of the American Medical Association*. 2003 Sep 3;290(9):1157-65.

## 4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Objective 1: Methods of Biomedical Communications The first three weeks of the course will review the historical development of methods of scientific communication, provide students with instruction in the use of on-line scientific literature research tools, the peer review process used in evaluating submissions for publication and finally outline the basic principles of effective scientific presentations. The critical features of a good scientific argument, as well as common errors of logic in developing arguments and hypothesis, will be presented and discussed.
2. Objective 2: Writing in the Sciences The presentation and writing components will start

during weeks 2- 3. Four different writing exercises will be assigned during the course: three short and one long. The short exercises will consist of:

- Scientific papers will be selected by the instructor, which students will be required to read and summarize in the form of a lay report (1,000 words or less) of the type that one might expect to see in the science editorial section of a newspaper.
- A series of reprints will be posted to the D2L site for the Students will each have to choose one of these reprints and summarize it, in no more than two single-spaced pages, as a handout that might be used, for example, in a journal club presentation.
- The final short exercise will be the final exam (date TBA) which will consist of five written answer questions on various aspects of personalized medicine, of which you have to answer 3, in a two-hour time period. This will test your ability to write logical short essay style responses to questions, under time pressure.

The long assignment will consist of an unpublished draft manuscript that is complete in terms of the Abstract, Introduction, Methods, Results, Figures and References; but with the Discussion removed by the instructor. The task for students will be to take the material available to them and write a discussion that fairly reflects both the literature provided and the results presented, WITHOUT exceeding the total word limit for the paper defined by the journal instructions. To simulate the process that scientists have to go through in submitting and publishing their work, student submissions will be distributed, anonymously, by the instructor to other students in the class for them to comment on and provide feedback – which is what happens with peer-reviewed scientific journal submissions. The feedback will be passed back to the original authors, again anonymously, and the authors can if they wish then use that feedback to improve their papers prior to final submission. ONLY the final submitted paper will be graded, and ONLY the instructors will know the identities of both the authors and the reviewers. High quality reviews will earn the reviewers up to 5% of the total course mark, in addition to the grades that they get for their own papers. Comments and feedback on all the written assignments will also be provided by the instructors, as learning tools for students as they progress through the course. Students are also encouraged to avail themselves of the writing assistance resources available through the University of Guelph Library (the web link is provided, below). Notably, the Library provides a number of useful handbooks on writing in the sciences, as well as the opportunity to arrange meetings with

professional writing consultants (up to 3 meetings per semester, per student). Use these resources will help to avoid the most common structural and grammatical errors during the preparation of the written assignments.

3. Objective 3: Developing Effective Oral Communication Skills Presentations will take up the majority of the in-class time after the lecture sessions in the course. Two basic presentation formats will be included, with feedback being provided by the instructor and TA, as well as other students. All of the topics in the course will be drawn from currently active areas of research in the Health Sciences, so in addition to providing the students with practice at developing oral presentations and improving their speaking ability, the information presented in the classes will be informative and of interest to the entire class.

Presenting scientific material to others now comes in two basic forms – presentations at scientific meetings (either as oral presentations or, more commonly, as posters) or presentations of ideas and proposals – for example, presenting case scenarios to colleagues in either a business or clinical situation, or an idea to a company or a group of potential investors, asking for financial support to develop a concept. Posters are now increasingly common in other final year classes in the B.Sc. curriculum and students in general have become quite good at this presentation format, so we will not revisit that type of presentation in this class. Instead, we will focus on oral small-group type presentation scenarios.

- Groups of 3-5 students each (three groups per presentation day) will be assigned clinical case scenarios or case reports presenting different viewpoints of a subject, which they will have to present and discuss on their assigned day. For each presentation, the other students in the class will be required to submit written comments critiquing the presentations and the arguments presented. There will be provided (anonymously) to the presenters, for their information. Students will not have to attend ALL the presentations, because there will be occasions when students can't attend class (athletic team events being one possible conflict). You only have to attend and comment on 5 of the 7 days of presentations by other students during the course (submitting 1 paragraph, a maximum of 250 words, per presentation). Written feedback should be submitted for each presentation by the end of the week in which the presentation took place, so that it can be returned (anonymously) to the presenters, for their benefit.
- In the same groups assembled for the poster presentations, students will

develop a 15-18 minute Powerpoint research presentation on a topic chosen by the group, the only limitation being that the subject must be relevant to material being presented in the course (i.e. personalized medicine). These presentations should include a brief review of the literature in the field, to provide the rationale for a research proposal which will be defended in front of the class in a format similar to the popular "Dragon's Den" and "Shark Tank" TV programs. The research proposal should include a brief summary of the methodology and experimental approaches that you might use. Seven to ten minutes will be available at the end of each presentation for questions from other students, so that 2 presentations can be included in each 50 minute lecture slot. Each group should prepare and submit a two page summary of their presentation (point form, like the one prepared for writing assignment 2C) and submit in pdf format BOTH the summary and the presentation itself the day before the presentation is scheduled, so they can be posted to CourseLink for the benefit of the rest of the class.

- All students in the class will, in addition, be required to submit written comments critiquing a total of 5 "Dragon's Den" presentations by other students during the course (1 paragraph, ~250 words, per presentation).

The brief Dragon's Den critiques should be submitted by the end of the week following the presentations – Nov 3 for the poster critiques, Dec 6 at the latest (Drop boxes will be available for electronic submission of ALL assignments – you don't need to print out and submit hard copies).

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## 5 Teaching and Learning Activities

This is a lecture- AND discussion-based course, with some independent and some group learning components. Students are expected to participate in discussions and to conduct themselves in a scholarly and respectful manner at all times.

Class location and meeting times:

Mon, Wed & Fri: 10:30AM - 11:20a.m. Richards Building (RICH) Room 2529

Office Hours OVC 1668 Tuesday 2-5pm

### 5.1 Lecture

<b>Topics:</b>	Introduction to Course
<b>Topics:</b> Lectures and class exercises	Biomedical Communication: what's important?
<b>Topics:</b> Peer Review: why, how, is it important?	Biomedical Communication: what's important?
<b>Topics:</b> Gender Bias in Medicine lecture 1 and 2	Gender Bias in Medicine
<b>Topics:</b> Gender Bias in Medicine Lecture 3: Drug Metabolism	Gender Bias in Medicine
<b>Topics:</b> Endocrinology	Personalized Medicine in Endocrinology
<b>Topics:</b>	No class – Thanksgiving/Reading break
<b>Topics:</b> Case Study Sessions 1 to 7	Clinical Case Study Sessions (7)
<b>Topics:</b> Cancer Lecture 1 to Cancer Lecture 4	Personalized Medicine in Hormone Dependent Cancer
<b>Topics:</b> Dragon's Den: Student Seminars	Dragon's Den

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## 6 Assessments

In all of the group assignments, students in each group will receive the same grade. In addition, students in each group will be asked to provide a mark out of 5 (the "group self-assessment" score) to rate the other student(s) effort and contribution to the group presentations.

### 6.1 Assessment Details

**Written assignment 1 (10%)**

**Written assignment 2 (10%)**

**Written assignment 3 (20%)**

**Clinical Case Study presentation (10%)**

**"Dragon's Den" presentation (10%)**

**Group self-assessment (5%)**

**Individual written critiques of 5 case study and 5 "Dragon's Den" presentations (10%)**

**Editorial feedback on other student submissions for the 4th written assignment (5%)**

**Final written exam (20%)**

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## 7 Course Statements

### 7.1 What is Personalized Medicine?

Personalized medicine is an extension of traditional approaches to understanding and treating disease. Since the earliest days of modern medicine, physicians have used evidence-based approaches based on observation and objective research findings to determine the best way to treat their patients. There was a degree of “personalization” in that treatments were diagnosis based – a diagnosis of breast cancer, for example, might result in one of a number of different established radiation or chemotherapy based protocols. However, individual differences between patients in terms of their clinical presentation, or the specific properties of the tumors in each patient, were not used in refining therapy to optimize outcomes.

In modern personalized medicine, the tools provided to the physician are more precise, probing not just the obvious (such as an X-ray picture or histology slide), but the molecular characteristics of each individual patient’s metabolism as well as the specific properties of their disease. Looking at the patient at this level helps the physician understand the patient’s metabolism at a previously unparalleled level of detail, allowing treatment to be optimized on a patient by patient basis.

### 7.2 Course Evaluation

Students will be asked to complete a questionnaire on the instructors teaching abilities. This information is required by the university to evaluate faculty performance for purposes of Tenure, Promotion and Annual Pay Increases. Administered by a third party rather than the instructor, these evaluations will be delivered to the instructors only after the final grades have been submitted to the Registrar’s Office. The numerical ratings from the form will be made available to the Chair for administrative purposes. If a student wishes the Chair to see his/her written comments in addition to the scores, he/she must include with those comments his/her name (written legibly) and signature.

## 8 University Statements

### 8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

## 8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

## 8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

## 8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

## 8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is

required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website  
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website  
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

## 8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct  
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct  
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

## 8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## 8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma

programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

## 8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

## 8.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

## 8.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

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