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-Requisite(s): 14.00 credits including BIOL*1080, STAT*2040
Restriction(s): Restricted to students in BSCH:BIOM.

1.2 Timetable

Richards Building (RICH) Room 2529
Mon-Wed-Fri 10:30-11:20am

1.3 Final Exam

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

2 Instructional Support

2.1 Instructor(s)

Neil MacLusky
Email: nmaclusk@uoguelph.ca
Telephone: +1-519-824-4120 x54073
Office: OVC 1688
3 Learning Resources

3.1 Recommended Resource(s)

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


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. 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.


The general aims of this course are:

- to assist students in developing clear, concise and logical approaches to biomedical
- 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
- 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.

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:
• Students will be asked to prepare a brief personal statement, of the kind that might be required for application to a professional school (e.g. human or veterinary medicine, dentistry, graduate research – whatever is most appropriate for each student).

• 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

• 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 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 an idea to a company or a group of potential investors, asking for financial support to develop a concept. We will explore both in class.
• Groups of 3-4 students will prepare posters on some aspect of personalized medicine, potentially based on either the lectures or the posted Posters will be prepared based on a Powerpoint template posted by the instructor to the Courselink site. Students will not have to arrange to print the posters themselves – they will be able to submit them all online and they will be printed commercially in time to be picked up the day before the poster presentations. All students in the class will, in addition, be required to submit written comments critiquing a total of 5 poster presentations by other students during the course (1 paragraph, up to 250 words, per presentation).

• 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. This is particularly important this year because, with the expanded class size, the Dragon’s Den presentations will have to be split to run concurrently in two rooms, to allow all students to present within the time available. If summaries of all presentations are posted, then every student in the class will have a chance to at least read the summaries of presentation they are unable to attend.

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

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
5.1 Lecture

**Topic(s):** Introduction to Course

**Topic(s):** Biomedical Communication: what’s important? Lectures and class exercises

**Topic(s):** Biomedical Communication: what’s important? Peer Review: why, how, is it important?

**Topic(s):** Gender Bias in Medicine Gender Bias in Medicine lecture 1 and 2

**Topic(s):** Gender Bias in Medicine Gender Bias in Medicine Lecture 3: Drug Metabolism

**Topic(s):** Personalized Medicine in Endocrinology

**Topic(s):** Endocrinology

**Topic(s):** No class – Thanksgiving/Reading break

**Topic(s):** Poster Sessions Poster Sessions 1 to Poster Sessions 7

**Topic(s):** Personalized Medicine in Hormone Dependent Cancer Cancer Lecture 1 to Cancer Lecture 4

**Topic(s):** Dragon’s Den Dragon’s Den: Student Seminars

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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 (5%)

Written assignment 2 (5%)

Written assignment 3 (10%)

Written assignment 4 (20%)

Poster presentation (10%)

“Dragon’s Den” presentation (10%)

Group self-assessment (5%)

Individual written critiques of 5 oral group presentations 5 poster presentations (10%)

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

Final written exam (20%)
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 regulations and procedures for Academic Consideration are detailed in the Undergraduate Calendar.
8.3 Drop Date
Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

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.

More information: www.uoguelph.ca/sas

8.6 Academic Misconduct
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 discourages misconduct. 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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

8.7 Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate 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 which apply to undergraduate, graduate and diploma programs.