1 Course Details

1.1 Calendar Description

This course will explore a variety of issues related to the scientific ideals and practical realities of health sciences research and its clinical applications. Topics will include critical thinking, critical appraisal of the medical literature, the principles of evidence based medicine, and selected issues related to scientific integrity.

Pre-Requisites: 7.50 credits including (1 of BIOL*1070, BIOL*1080, BIOL*1090)
Restrictions: BIOM*4210

1.2 Course Description

Systematic assessments of the quality of published clinical research typically indicate that only about 20-30% of randomized controlled trials (RCTs) are free of important errors, and that a similar proportion are highly flawed and misleading. It is therefore important that the graduates of healthcare programs be equipped with skills to assess RCT quality prior to incorporating their findings into clinical practice. Unfortunately, professional programs and most undergraduate and graduate programs provide limited education on how to evaluate these studies, and as a result many physicians, veterinarians, dentists, and other healthcare providers lack the ability to recognize whether a trial they read is relatively sound or likely to be misleading. The good news is that you don't need to be a statistician or epidemiologist to be able to detect many of the common errors in the medical literature. By the end of this course, you will have markedly improved your ability to distinguish the good from the bad.

Even when good scientific evidence has been identified, it is not necessarily used to guide clinical decisions; the information may not be considered at all, or flawed reasoning may enter into the decision making process. We will explore errors of reasoning that are so well
recognized that they have been given names. We will also look at some of the reasons that we are prone to such errors, so we can try to avoid making them.

We will also discuss selected issues related to professional integrity and ethics.

1.3 Timetable
Timetable is subject to change. Please see WebAdvisor for the latest information.

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

2 Instructional Support

2.1 Instructional Support Team

| Course Co-ordinator: | Brad Hanna BSc, DVM, MSc, PhD |
| Email: | bhanna@uoguelph.ca |
| Telephone: | +1-519-824-4120 x54534 |
| Office: | OVC 1646D |

3 Learning Resources

3.1 Required Resources


Thinking, Fast and Slow. D Kahneman, Anchor Canada, 2013. (Textbook)

3.2 Recommended Resources

   Available on Ares course reserve. An excellent resource for understanding fallacies.

   Available on Ares course reserve. Focuses on errors of reasoning in medical research and
medical communication, and gives examples.

Unit 2 - The CONSORT Statement 2010 Checklist (Website)

Unit 2 - The CONSORT Statement 2010 Elaboration Document: (Website)
http://www.consort-statement.org/downloads/consort-statement

4 Learning Outcomes

4.1 Course Learning Outcomes
By the end of this course, you should be able to:

1. Logic & Reasoning Unit At the end of this unit, you will be able to:
   1. Critically evaluate arguments according to five key criteria, and develop good arguments
   2. Recognize common errors of logic and tactics for avoiding a good argument
   3. Evaluate potential causes of errors of reasoning with respect to the heuristics and biases associated with our "autonomic decision maker" (Kahneman’s System 1)

2. Critical Appraisal Unit At the end of this unit, you will be able to:
   1. Assess the quality of reporting of clinical trials at an intermediate level, based on CONSORT recommendations
   2. Justify selected scientific procedures for the avoidance of bias
   3. Understand the differences and interrelationships between a clinical trial, a systematic review, and a body of evidence
   4. Recognize common ways in which medical research data can be misrepresented in scientific publications

3. Scientific Integrity & Professionalism Unit At the end of this unit, you will be able to:
   1. Develop informed opinions about ethical issues related to health sciences research, such as plagiarism, fabrication of data, selective citation of the literature, authorship, peer review, and conflicts of interest
   2. Be able to analyze the ethics of medical claims and beliefs using the criteria of WK Clifford
5 Teaching and Learning Activities

Lectures

Monday, Wednesday, and Friday 1:30 – 2:20 pm, MACN 113

Some standard lectures will be given. Some classes will take the form of discussions of short readings that will be posted on Courselink a couple of days in advance. Some materials associated with class discussions will be posted following the class.

Seminar Presentations

Seminars presented by students will be testable. Notes will be provided shortly after these seminars.

Lecture Schedule

Details regarding lecture topics will be provided on the course website.

6 Assessments

Students will work in assigned groups for some written assignments and oral presentations. To date, the course has concluded with a short-answer/point form final examination covering all subjects; this year a mid-term examination may or may not be added. Details will be provided on the course website at the beginning of the semester.

7 Course Statements

7.1 Notes on assessments

On Line Quizzes

Quizzes are formative assessments intended to help students monitor their understanding of the material as the course progresses. You are encouraged to complete these well in advance of the deadline as no extensions will be granted for technical reasons. Computer and network problems may occur at any time, so if you leave a quiz until the last minute you take the risk that you will be unable to complete it by the deadline.
Group Assessments and Working Rules

Some learning activities will be completed in assigned groups. Group work will be most successful if all team members contribute their fair share and try to have fun. Timely arrival at, and participation in, group meetings is crucial to effective teamwork. Those who fail to meet group obligations may be required to complete assignments independently with a penalty applied.

Late Assignments

In the absence of documented extenuating circumstances (medical or compassionate), late submissions will be penalized 10% per day.

Department of Biomedical Sciences Guideline for Students with 3 Final Exams in a 48-hour Period

Eligibility
Student eligibility for this process is at the discretion of the Chair. For students with three or more exams in a 48-hour period in the first week of the final exam schedule, including an exam in a course offered by the Department of Biomedical Sciences, the department may offer a second writing of the exam in the second week of the final exam period. This policy does not apply to exams requiring complicated set-up, such as lab exams.

Process
The second sitting (a single date and time for all students seeking this accommodation) will be scheduled by the Chair’s Office and invigilated by the course instructor, if available, or by the course TA or another invigilator. Following completion of the exam, the instructor/TA will mark the papers and submit the grades to the Registrar within 7 days of the last scheduled day of the final exam period.

Eligible students can request this privilege by sending an e-mail message by the 40th class day to the Department Chair (Dr Tarek Saleh). In their request, the student MUST list their complete final exam schedule and a verbatim copy of the following statement:
“This is an accurate representation of my final exam schedule for the current semester as issued by the Registrar's office. I understand that if I have misrepresented my exam schedule and am granted permission to write the BIOM*3210 exam at the later date on that basis, I will have violated the University's academic misconduct policy which may result in a grade of zero for the BIOM*3210 final exam. I understand that steps will be taken to verify my course enrollment and final exam schedule.”

Although the Department will make every effort to accommodate these requests, circumstances may not allow accommodation in all situations, and so we cannot guarantee that requests will be approved. All email requests will receive a written response from the Chair regarding the decision.

7.2 Attendance

Participation in classroom discussions will help to prepare students for the assessments. Substantial issues that are discussed in class may be examined and will not necessarily be captured in the posted material, so if you are absent from a class you should ask a classmate for notes.

7.3 Academic Consideration for Missed Assignments

If you are unable to meet a course deadline for medical or compassionate reasons, please review the regulations on academic consideration in the Undergraduate Calendar and discuss your situation with the course coordinator and/or program counsellor.

If the final exam is missed, application for a deferred exam must be made through your program counsellor and the office of the Registrar as outlined in the Academic Consideration and Appeals section of the Undergraduate Calendar. Please see the calendar for more information.

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
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-regregchg.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.

More information can be found on the SAS website
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