RATIONALE FOR THE COURSE

Avoidable errors in experimental design, methodology, analysis, and interpretation affect the majority of clinical trials conducted in all health professions. It has been estimated that only about 20% of the published medical research is free of important flaws, leaving the conclusions of the remaining 80% in doubt. The situation is improving, but progress is slow. Even when good scientific evidence is available regarding a specific health issue, 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. This course will address some of the major problems related to clinical trial quality and reporting in the health sciences, and critical thinking as it relates to the use of medical knowledge. Selected issues that influence public perceptions of science in general will also be discussed.

INSTRUCTORS

WJ Brad Hanna, DVM, PhD
Office: Rm 1646D, OVC Main Building (lower level, near the corner of College & Gordon)
E-mail: bhanna@uoguelph.ca
Office hours: By appointment

Guest speakers to be announced

LECTURE AND SEMINAR TIMES

Lectures
Monday, Wednesday, and Friday 1:30-2:20 pm Room: MCKN 117

Seminars
Some Friday lecture slots will be used for seminars to be presented by students in this course or the graduate course BIOM*6400
UNDERGRADUATE 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.

LEARNING OUTCOMES

This course is divided into three units. Specific Learning Outcomes by Unit:

Unit 1: Logic & Reasoning
By the end of this unit, students will be able to:
  a) critically evaluate arguments according to five key criteria, and develop good arguments
  b) recognize common errors of logic and tactics for avoiding a good argument

Unit 2: Critical Appraisal & the CONSORT Statement
By the end of this unit, students will be able to:
  a) assess the quality of reporting of clinical trials at an intermediate level, based on CONSORT recommendations
  b) justify selected scientific procedures for the avoidance of bias
  c) understand the differences and interrelationships between a clinical trial, a systematic review, and a body of evidence
  d) recognize common ways in which medical research data can be misrepresented in scientific publications

Unit 3: Scientific Integrity & Professionalism
By the end of this unit, students will:
  a) 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, conflict of interest, etc.
  b) be able to analyze the ethics of medical claims and beliefs using the criteria of WK Clifford

LEARNING RESOURCES

Unit 1
Unit 2

METHODS OF ASSESSMENT (*Subject to change)

<table>
<thead>
<tr>
<th>Form of Assessment</th>
<th>Weight</th>
<th>Due Date</th>
<th>Course Content /Activity</th>
<th>Learning Outcome Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-line quizzes*</td>
<td>15%</td>
<td>TBA</td>
<td>TBA</td>
<td>All course LOs*</td>
</tr>
<tr>
<td>Written assignments*</td>
<td>20%</td>
<td>Sep +/or Oct</td>
<td>Argument assessment</td>
<td>Unit 1 LOs</td>
</tr>
<tr>
<td>Group Presentations</td>
<td>25%</td>
<td>Oct &amp; Nov</td>
<td>CONSORT Statement</td>
<td>Unit 2 LOs</td>
</tr>
<tr>
<td>Presentation critiques</td>
<td>5%</td>
<td>Oct &amp; Nov</td>
<td>Submit feedback on seminar presentations</td>
<td>Unit 2 LOs</td>
</tr>
<tr>
<td>Final examination</td>
<td>35%</td>
<td>Scheduled by the Registrar</td>
<td>Comprehensive</td>
<td>All course LOs</td>
</tr>
</tbody>
</table>

Notes on assessments

Final Examination
The final examination will cover all course material. The format will be short-answer and point form.

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.

Late Assignments
One late assignment (up to 1 week past the due date) may be submitted without penalty during the semester. Additional late submissions without acceptable cause will be penalized 20% per day.
### TEACHING METHODS

**Lectures**
Some standard lectures will be given, with lecture slides posted in pdf form by 7 pm the night before. Some classes will take the form of a discussion of short readings that will be posted on D2L a couple of days in advance. Some materials associated with class discussions will be posted following the class.

**Seminar Presentations**
Students taking the graduate critical thinking course BIOM*6400 will be presenting seminars during some of our Friday classes, and the material will be testable. Notes will be provided shortly after these seminars.

Students taking BIOM*3210 will participate in one major group presentation describing the importance of a CONSORT Statement checklist item. This presentation will count for 25% of the course grade.

### COURSE POLICIES AND PROCEDURES

**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.

**Accommodations for Students with Disabilities**
The University of Guelph accommodates students with disabilities who have registered with Student Accessibility Services (SAS; formerly the Centre for Students with Disabilities). Students who require assistance from SAS must register with the centre (preferably within the first week of class) to verify their eligibility for accommodation, and contact the course coordinator at the beginning of the semester to discuss their specific needs. To schedule a registration appointment with a disability advisor, call the centre at 519-824-4120 x56208 or contact SAS by e-mail (refer to the CSD/SAS website).

**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 counselor 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.
Recording of Classes
Presentations which are made in relation to course work—including lectures—may not be recorded in any electronic format without the permission of the presenter, whether the instructor, a classmate or a guest lecturer. When permission is granted, the material is not to be disseminated and is to be deleted at the end of the semester.

E-mail Communication
As per university regulations, all students should check their “uoguelph.ca” e-mail account regularly; e-mail is the official route of communication between the University and its students.

Drop Date
The last date to drop this course, without academic penalty, is the 40th class day. Consult the Schedule of Dates in the Undergraduate Calendar for this date.

Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and enjoin all members of the University community – faculty, students, and staff – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. The University of Guelph takes a serious view of academic misconduct and it is your responsibility as a student to be aware of, and to abide by, the University’s policy. Included in the definition of academic misconduct are such activities as cheating, plagiarism, misrepresentation, and submitting the same material in two different courses without written permission. To better understand your responsibilities, students are expected to read the section on Academic Misconduct in the Undergraduate Calendar and academic integrity policies online:

https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml
http://www.academicintegrity.uoguelph.ca

Students must also be aware that faculty have the right to use software to aid in the detection of plagiarism or copying and to examine students orally on submitted work. For students found guilty of academic misconduct, serious penalties including possible suspension or expulsion from the University of Guelph may be imposed.

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.