

| COURSE OUTLINE | | |
|---|---|---------------------|
| TERM: Fall 2018 | COURSE NO: PHIL 120 | |
| INSTRUCTOR: | COURSE TITLE: Scientific Reasoning | |
| OFFICE: LOCAL: E-MAIL: @capilanou.ca | SECTION NO(S): | CREDITS: 3.0 |
| OFFICE HOURS: | | |
| COURSE WEBSITE: | | |

Capilano University acknowledges with respect the Lil'wat, Musqueam, Squamish, Sechelt, and Tsleil-Waututh people on whose territories our campuses are located.

COURSE PREREQUISITES/CO-REQUISITES

None

COURSE FORMAT

Three hours of class time, plus an additional hour delivered through on-line or other activities for a 15-week semester, which includes two weeks for final exams.

CALENDAR DESCRIPTION

This course focuses attention on the analysis and evaluation of inductive arguments. We begin by exploring the basic principles of inductive reasoning and then utilize these principles to explore such topics as rational decision making, the nature and testing of scientific theories in both the natural and social sciences and the difference between causal relations and correlations. Attention will also be given to the fallacies involved in the appeal to polls and statistics.

COURSE NOTE

PHIL 120 is an approved Quantitative/Analytical course for baccalaureate degrees.
 PHIL 120 is an approved Science and Technology course for Cap Core requirements.
 There are no prerequisites, but the course is a natural continuation of PHIL 110, and will appeal especially to students who have an interest in either the natural or social sciences.

REQUIRED TEXTS AND/OR RESOURCES

Ronald N. Giere, John Bickle, and Robert Mauldin. *Understanding Scientific Reasoning*, 5th Ed. Belmont, CA: Wadsworth, 2006.

COURSE STUDENT LEARNING OUTCOMES

On successful completion of this course, students will be able to do the following:

- Explain the distinction between science and other areas of inquiry
- Explain the key concepts in scientific reasoning
- Describe the fundamental nature of theoretical hypotheses

- Summarize reports of statistical studies
- Summarize reports of causal studies
- Summarize various models of decision-making
- Apply general evaluation techniques to the various kinds of scientific studies and reports

Students who complete this Science and Technology course will be able to do the following:

- Apply numerical and computational strategies to solve problems.
- Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
- Demonstrate how a problem, concept, or process can be modelled numerically, graphically, or algorithmically.
- Explain how scientific inquiry is based on investigation of evidence and evolves based on new findings.

COURSE CONTENT

| | |
|--------------|---|
| Week 1 | Introduction / Why Study Scientific Reasoning? |
| Week 2 | Understanding and Evaluating Theoretical Hypotheses |
| Week 3 | Historical Episodes |
| Week 4 | Marginal Science |
| Week 5 | Statistical Models and Probability |
| Weeks 6,7 | Evaluating Statistical Hypotheses |
| Week 8 | Causal Models |
| Weeks 9,10 | Evaluating Causal Hypotheses |
| Week 11 | Models of Decision Making |
| Weeks 12, 13 | Evaluating Decisions |
| Weeks 14,15 | Exam Period |

EVALUATION PROFILE:

| | |
|----------------------------------|-----------------|
| Participation/In-class exercises | 10% |
| Research assignment | 15 – 20% |
| Tests | 20 – 50% * |
| Final Exam | <u>20 – 30%</u> |
| Total = | 100% |

* Note: No single evaluation component will be worth more than 35%.

The final grade for the course will be made up of the following: participation in class and completion of in-class exercises (1% for each one adequately done, to a maximum of 10%); in-class tests; a final exam; and a research assignment (a description and evaluation of an approved scientific report using the skills developed throughout the course).

GRADING PROFILE

| | | | |
|-------------|------------|------------|-----------|
| A+ = 90-100 | B+ = 77-79 | C+ = 67-69 | D = 50-59 |
| A = 85-89 | B = 73-76 | C = 63-66 | F = 0-49 |
| A- = 80-84 | B- = 70-72 | C- = 60-62 | |

Incomplete Grades

Grades of Incomplete "I" are assigned only in exceptional circumstances when a student requests extra time to complete their coursework. Such agreements are made only at the request of the student, who is responsible to determine from the instructor the outstanding requirements of the course.

Late Assignments

Not accepted.

Missed Exams/Quizzes/Labs etc.

Students will be assigned a mark of zero for all missed assignments, essays, or tests. Make-up exams, quizzes and/or tests are given at the discretion of the instructor. They are generally given only in medical emergencies or severe personal crises. Please consult with your instructor.

Attendance

Students are expected to attend regularly, to be punctual, to contribute to discussions, and to behave appropriately in the classroom.

English Usage

Students are expected to proofread all written work for any grammatical, spelling and stylistic errors. Instructors may deduct marks for incorrect grammar and spelling in written assignments.

Electronic Devices

Students may use electronic devices during class for note-taking only. Avoid/turn off all other electronic distractions. During in-class tests, turn off all electronic devices and remove them from the desk.

On-line Communication

Outside of the classroom, instructors will (if necessary) communicate with students using either their official Capilano University email or Moodle; please check both regularly. Official communication between Capilano University and students is delivered to students' Capilano University email addresses only.

UNIVERSITY OPERATIONAL DETAILS

Tools for Success

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: <http://www.capilanou.ca/services/>

Capilano University Security: download the CapU Mobile Safety App**Policy Statement (S2009-06)**

Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Academic Integrity, Academic Probation and other educational issues. These and other policies are available on the University website.

Academic Integrity (S2017-05)

The University has strict policies governing academic dishonesty. In this course, the minimum penalty for (intentional) plagiarism or cheating will be a grade of zero on the examination or assignment. Serious offences may result in a fail grade for the course, suspension from the university, or expulsion from the university.

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. See policy S2017-05 for more information: <http://www.capilanou.ca/about/governance/policies/Policies/>

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

Academic dishonesty is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

Cheating: Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:

- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

Fraud: Creation or use of falsified documents.

Misuse or misrepresentation of sources: Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

Plagiarism: Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

Self-Plagiarism: Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

Prohibited Conduct: The following are examples of other conduct specifically prohibited:

- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,
- Assisting or attempting to assist another person to commit any breach of academic integrity.

Sexual Violence and Misconduct

All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. The University expects all Students and Members of the University Community to abide by all laws and University policies, including [B.401 Sexual Violence and Misconduct Policy](#) and [B.401.1 Sexual Violence and Misconduct Procedure](#).

Emergencies: Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.