

# PHIL R100: CRITICAL THINKING

**Originator**

chorrock

**College**

Oxnard College

**Discipline (CB01A)**

PHIL - Philosophy

**Course Number (CB01B)**

R100

**Course Title (CB02)**

Critical Thinking

**Banner/Short Title**

Critical Thinking

**Credit Type**

Credit

**Start Term**

Fall 2021

**Catalog Course Description**

This course provides an introduction to critical thinking by emphasizing analytical reasoning. The course examines inductive and deductive reasoning as well as other forms of persuasion. Topics include analysis of arguments, explanations, and informal fallacies that occur in the natural sciences, social sciences (including applied ethics), the humanities, (such as philosophy or art criticism), as well as everyday discourse. Critical thinking and problem-solving skills to be developed include identifying and evaluating arguments; recognizing and correcting reasoning errors; constructing arguments based on sound methods of reasoning; and assessing subjects from multiple theoretical points of view.

**Taxonomy of Programs (TOP) Code (CB03)**

1509.00 - Philosophy

**Course Credit Status (CB04)**

D (Credit - Degree Applicable)

**Course Transfer Status (CB05) (select one only)**

A (Transferable to both UC and CSU)

**Course Basic Skills Status (CB08)**

N - The Course is Not a Basic Skills Course

**SAM Priority Code (CB09)**

E - Non-Occupational

**Course Cooperative Work Experience Education Status (CB10)**

N - Is Not Part of a Cooperative Work Experience Education Program

**Course Classification Status (CB11)**

Y - Credit Course

**Educational Assistance Class Instruction (Approved Special Class) (CB13)**

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

May be required

**Grading method**

Letter Graded

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Minimum Contact/In-Class Lecture Hours**

52.5

**Maximum Contact/In-Class Lecture Hours**

52.5

**Activity**

**Laboratory**

**Total in-Class**

**Total in-Class**

**Total Minimum Contact/In-Class Hours**

52.5

**Total Maximum Contact/In-Class Hours**

52.5

**Outside-of-Class**

**Internship/Cooperative Work Experience**

**Paid**

**Unpaid**

**Total Outside-of-Class**

**Total Outside-of-Class**

**Minimum Outside-of-Class Hours**

105

**Maximum Outside-of-Class Hours**

105

**Total Student Learning**

**Total Student Learning**

**Total Minimum Student Learning Hours**

157.5

**Total Maximum Student Learning Hours**

157.5

**Minimum Units (CB07)**

3

**Maximum Units (CB06)**

3

**Student Learning Outcomes (CSLOs)**

**Upon satisfactory completion of the course, students will be able to:**

- |   |  |
|---|--|
| 1 | Evaluate the quality/soundness of inductive arguments  |
| 2 | Apply one or more methods of inductive reasoning, for example, use of analogy, or causal reasoning, or probability claims, or hypothesis tests, etc. |
| 3 | Student will give reasons pro and con in discussion of an argument, theory or position in philosophy.  |
| 4 | Identify fallacious forms of reasoning   |

**Course Objectives**

**Upon satisfactory completion of the course, students will be able to:**

- |    |  |
|----|--|
| 1  | Distinguish fact from value, and knowledge from opinion.   |
| 2  | Distinguish narration from persuasion, as well as rational explanation from rational justification.  |
| 3  | Assess the strength or validity of the connection between premises and conclusions, evaluating whether conclusions follow from premises, deductively or inductively.                         |
| 4  | Analyze and evaluate arguments from a variety of subject area sources in terms of logical structure, use of language, type of reasoning, and type of evidence offered.                       |
| 5  | Analyze and evaluate assumptions and implications, both hidden and stated, of arguments from diverse sources.  |
| 6  | Recognize and assess the use and relevance of primary inductive reasoning forms, such as appeal to analogy, causal reasoning, probability and statistics, and scientific hypothesis testing. |
| 7  | Identify informal fallacies and explain the nature of their reasoning errors.  |
| 8  | Distinguish between the appropriate use of scientific methodologies and the abuse of pseudo-scientific facsimiles.   |
| 9  | Construct arguments and be able to refute poorly reasoned arguments using a variety of logical techniques.   |
| 10 | Demonstrate awareness of cultural diversity (a good thing) and cultural bias (a bad thing) if they appear in argumentation.  |

## Course Content

### Lecture/Course Content

1. The Elements of Logic and Critical Thinking
  - a. Arguments
    - i. Descriptions, explanations, justifications and other uses of language
    - ii. Premises and conclusions
    - iii. Assumptions and implications
  - b. Reasoning
    - i. Deductive and inductive inferences
      1. Valid versus invalid inferences
      2. Strong versus weak inferences
      3. Sound versus unsound arguments
      4. Necessary versus empirical statement-claims
      5. How deduction and induction can operate together in analysis
    - ii. Varieties of inductive reasoning (inductive generalization)
      1. Appealing to a typical example
      2. Induction from past to future
      3. Analogical reasoning (induction by analogy)
        - a. Figurative
          - i. Simile
          - ii. Metaphor
        - b. Non-figurative/literal
        - c. Counter-argument analogies
        - d. Faulty analogies
        - e. Inductive analogy: Criteria
          - i. Relevance of similarities (positive analogy)
          - ii. Number of similarities
          - iii. Nature and degree of disanalogy (negative analogy)
          - iv. Number of primary analogues
          - v. Diversity among the primary analogues
          - vi. Degree of analogy between new/predicted instance and previously observed instances
          - vii. Specificity of the conclusion
        - f. Legal reasoning
          - i. Literal analogies
          - ii. Precedent law/statutes: e.g., the present case is "like" *People v. Harris*
        - g. Moral reasoning
          - i. Descriptive analogy
          - ii. Arguments from analogy versus counteranalogy
          - iii. Example: Abortion debate
            1. Harming a fetus is "like" committing an assault
            2. A fetus is a part of the mother's body, "like" a wart is part of one's hand
4. Causal reasoning
  - a. Causality
    - i. Necessary conditions: e.g., clouds necessary for rain
    - ii. Sufficient conditions: e.g., fire sufficient-for/causes heat
    - iii. Necessary and sufficient conditions: e.g., bachelor and unmarried male
  - b. (John Stuart) Mill's Methods of identifying causal connections
    - i. Method of agreement: identifies cause as necessary condition
    - ii. Method of disagreement: identifies cause as sufficient condition
    - iii. Method of residues: subtracting already-known casual connections from a causal claim
    - iv. Method of concomitant variation: matching variations in one condition with variations in another
  - c. Mill's methods and science
    - i. Method of controlled experiment
      1. Experimental group
      2. Control group
      3. Distribution curves (graphs/data)
      4. Longitudinal study
    - ii. Correlation

1. Positive correlation: one variable tends to increase/decrease parallel with another
2. Negative correlation: one variable tends to increase/decrease in opposition with another
3. No correlation: random, haphazard, or accidental association
4. Perfect correlation
5. Significant correlation
6. Spurious association: mistaking one variable for causing another, when they are merely associated, and a third factor is causing both; e.g., runny nose, watery eyes, (true cause of both: breathing pollen)
- iii. Inference from correlation to causation
- d. Contributing causes/partial causes
5. Probability
  - a. Classical theory: number of favorable results relative to number of possible results: e.g. selecting cards from a standard (game) deck
  - b. (Betting) Odds: number of favorable results relative to number of unfavorable results: e.g., rolling dice
  - c. Relative frequency theory: e.g., mortality tables (insurance companies)
  - d. Subjectivist theory: probability based on beliefs of individual people: e.g., horse race or stock market
  - e. Game Theory: e.g. the Prisoner's Dilemma, (predictions based on conditional/hypothetical assumptions)
6. Statistics
  - a. Generalizing from a sample
  - b. Samples and populations
    - i. Randomness: every member of a population has an equal chance of being selected
    - ii. Sample size
      1. Margin of error
      2. Confidence level
      3. Diversity
        - a. Heterogeneous group
        - b. Homogeneous group
    - iii. Stratified sampling of the value of a variable: e.g. testing for drunk drivers at peak/selected times, (and not at equally random times)
  - c. Statistical significance versus coincidental pattern
  - d. Designing tests and obstacles to collecting reliable data
    - i. Sample bias and psychological influence
    - ii. Fallacy of hasty generalization: jumping to conclusions, (unwarranted by evidence)
  - e. The meaning of the term "average"
    - i. Mean
    - ii. Median
    - iii. Mode
  - f. Dispersion (of data; how spread out data are in relation to numerical value)
    - i. Range (difference between smallest and largest)
    - ii. Variance (a measure of how far data are from a mean value/central tendency)
    - iii. Standard deviation: a measure of how far data deviate from the mean value; the square root of the variance
    - iv. Graphs of data: e.g. histogram (bar graph)
      1. Normal distribution/bell curve
      2. Varying (shapes of) curves relative to narrow or wide distribution/deviation
    - v. Erroneous/misrepresentation of data using graphs and pictograms
  - g. Induction from general to specific
7. Scientific methodology/hypothesis testing
  - a. Prediction, understanding, explanation
  - b. Test: observation/experiment intended to provide evidence
    - i. Confirming instances in experimentation
    - ii. Disconfirming instances in experimentation
      1. Actively seeking disconfirming evidence
      2. Ruling out hypotheses
    - iii. Principle of falsifiability: claims must be testable/refutable (if they are to produce scientific truth/knowledge)
    - iv. Accuracy, precision, rigor
    - v. Anecdotal evidence
    - vi. Independent verification
  - c. Law: sufficiently well-tested general claim
  - d. Theory: proposed explanation used to explain a wide variety of phenomena
  - e. Hypothesis: proposed explanation, claim or theory

- f. Creating and assessing alternative explanations
  - i. Identifying a problem
  - ii. Formulating a hypothesis
  - iii. Drawing/imagining implications (which should follow from) the hypothesis
  - iv. Testing (with an aim toward disconfirming) those implications
  - v. Decisive tests/"crucial" tests: tests which show whether a claim or hypothesis is false
- g. Tentative acceptance of hypotheses
  - i. Adequacy: hypothesis fits the facts intended to unify or explain
  - ii. Internal coherence: component ideas are rationally interconnected
  - iii. External consistency: hypothesis does not disagree with other well-confirmed hypotheses.
  - iv. Fruitfulness: hypothesis suggests new ideas for future analysis, experiment, and confirmation
- 8. Pseudoscience
  - a. Science and superstition
  - b. Hypotheses based on psychological versus logical elements
  - c. Science
    - i. Systematic collection of evidence
    - ii. Integrity
    - iii. Objectivity: How would a hypothetical *unbiased* observer weigh/judge the evidence?
    - iv. Ockham's Razor: (other things being equal) choose the simpler, less-fanastic of two rival theories
    - v. Replicability/repeatability (of test results by alternate, independent investigators under controlled conditions)
  - d. Pseudoscience
    - i. Post hoc fallacy: supposing that one variable causes another, when the only evidence is that one variable follows another a few times
    - ii. Fallacy of overemphasizing anecdotal evidence
    - iii. Experimenter bias: contaminating the design or implementation of a test
    - iv. Ad hoc modifications/"rescues" of a pre-favored position or theory
    - v. Examples
      - 1. Clairvoyance: Remote viewing of the world; seeing without being there
      - 2. ESP (Extrasensory perception): perception by means other than usual sense organs
      - 3. Precognition/fortune-telling
      - 4. Telepathy/mind-reading
      - 5. Confabulation: the unconscious brain/mind filling-in perceptual gaps using images from retrieved memory; e.g., imagining the phone is ringing when expecting a call
- 2. Fallacies
  - a. Mistaking value-based opinions for clear, reliable facts
  - b. Misrepresenting claims based on sincere beliefs for true, accurate, significant knowledge-claims
  - c. Propaganda and "mass" appeal
  - d. Emotionally-loaded language
  - e. Common informal fallacies of relevance
    - i. Fallacious appeal to authority
    - ii. Appeal to force
    - iii. Fallacious appeal to pity
    - iv. Ad hominem attacks
      - 1. Personal attacks and "Poisoning the well"
      - 2. "You also" (or "You're worse") fallacies
    - v. False dichotomies/false choice fallacies
    - vi. Fallacious diversions
      - 1. Straw man fallacy
      - 2. Red Herring fallacy
      - 3. Exaggeration
        - a. Overly exaggerated claims ("claim-inflation")
        - b. Overly dismissive claims (ridicule of otherwise reasonable claims)
      - 4. Pre-judging conclusions (prior to investigation)
      - 5. "Cherry-picking"/pre-selecting evidence in advance of investigation
    - vii. Question-begging
      - 1. Circular reasoning
      - 2. Complex questions/loaded-rhetorical questions
  - f. Common informal fallacies of ambiguity

- i. Vagueness: fuzzy claims
  - ii. Equivocation: multiplicity of meaning
3. Evaluating Arguments
- a. Analysis of premises and evidence
  - b. Assessment of logical structure
  - c. Review for fallacies (cultural bias, biased language, etc.)
  - d. Identification of appropriate inferences
  - e. Examination of assumptions and implications
  - f. Appraisal of argument(s)

### Laboratory or Activity Content

None

## Methods of Evaluation

**Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):**

Problem solving exercises  
Written expression

**Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):**

Computational homework  
Essay exams  
Essays  
Group projects  
Objective exams  
Problem-Solving Assignments  
Problem-solving exams  
Quizzes  
Reports/papers  
Research papers

## Instructional Methodology

**Specify the methods of instruction that may be employed in this course**

Audio-visual presentations  
Computer-aided presentations  
Class discussions  
Distance Education  
Field trips  
Instructor-guided interpretation and analysis  
Lecture

**Describe specific examples of the methods the instructor will use:**

1. 1 Instructor will direct interactive instructional activities asking students to compare and contrast the "intuitive" use of creative, practical, informal critical thinking skills with the formal, ruled-based methods of (mathematical) logic
2. Guided and focused class discussions of various informal, practical, scientific methodological problem-solving techniques. These discussions would elicit student recognition of types of problems encountered in critical thinking; methods to re/solve; solution/s to problem/s, etc.
3. Instructor will show video/s depicting the application of (informal) critical thinking skills with concrete counterparts, for example, the use of probability and statistical analysis in gambling games, the (commercial) insurance industry, prediction of weather (events)/climate, and so forth.

## Representative Course Assignments

### Writing Assignments

1. Text abstracts (e.g. summarize an author's position and arguments from an argumentative essay). (1-3 pg.)
2. Journal entries (e.g. report on your own observations of propaganda and pseudo-science as it presents itself in modern media). (1-3 pg.)
3. Write a thesis-defense critique (criticize and critically analyze the strengths and weaknesses of opposing viewpoints on the issue of the trial and death of Socrates) (3 pgs.)

4. Write a short explanatory paper (e.g. on the issue of scientific cloning for the purpose of furthering medical research, include elements from both scientific and social scientific points of view). (3 pgs.)

### **Critical Thinking Assignments**

1. (We *are* critical thinking. We tell others whether they are justified. Not vice versa.) Participate in class and small group discussions which engage in dialogue about solving problems in practical (non-formal) logic, for example, law-school-style (LSAT) applied reasoning questions.
2. Compare and contrast different methodological approaches of assessing arguments in critical thinking: e.g., analogy/analogical (methods), correlation, hypothesis-testing, etc.

### **Reading Assignments**

1. Assigned text (e.g. specific chapters or topics in a standard critical thinking or applied logic text)
2. Critical essays/articles (e.g. readings from current literature and/ or the history of philosophy, science, social science, and/or the humanities.)
3. Topical essays (e.g. "Pro-Con" style "ethical" argument essays on current controversial issues)
4. Newspaper articles, opinion-editorial pieces, and basic analytical writing (from a variety of fields and sources)

### **Skills Demonstrations**

1. Putting an ordinary-language argument into "standard form," in order to assess its inductive strength and soundness.
2. Using critical thinking "tools" of thought, such as (John Stuart) Mill's Methods of (causal) analysis to affirm and/or eliminate (possible) causes (in particular sorts of critical thinking inquiries).

### **Other assignments (if applicable)**

1. Library or internet-researched material (e.g. gather up-to-date statistics of voting patterns in the last presidential election and analyze).
2. Review video lectures on current topics in social sciences (and natural sciences, if applicable)
3. Design and conduct a project or experiment which exemplifies and applies concepts studied in this course.

## **Outside Assignments**

### **Representative Outside Assignments**

1. Reading/s of primary source materials in critical thinking/philosophy of science, and completing homework-style problems related to the reading/s.
2. Reading/s of secondary source materials in critical thinking/philosophy of science, and completing homework-style problems related to the reading/s.
3. Reviewing video of, for example, open-source university lectures on topics in critical thinking/philosophy of science
4. Searching for video related to course topics, but not included in the syllabus, and/or course bibliography
5. Research electronic databases, e.g., Standard Encyclopedia of Philosophy, for additional material on a subject
6. Reviewing content found on university/4-yr. college philosophy department websites, including philosophy program features, instructor web pages (of recent work, professional background), student web pages, insofar as they are indicative of professional work within the field of critical thinking/philosophy of science.
7. Weekly short essay assignments related to class lecture and assignments.
8. Library/Learning resource search-inquiries and assignments.
9. (Self)-Reports/-ing of searches/inquiries, outcomes of searches, interpretation/analysis of searches.

## **District General Education**

### **A. Natural Sciences**

### **B. Social and Behavioral Sciences**

### **C. Humanities**

### **D. Language and Rationality**

#### **D2. Communication/Analytical Thinking**

Approved



**E. Health and Physical Education/Kinesiology**

**F. Ethnic Studies/Gender Studies**

**CSU GE-Breadth**

**Area A: English Language Communication and Critical Thinking**

**A3 Critical Thinking**

Approved

**Area B: Scientific Inquiry and Quantitative Reasoning**

**Area C: Arts and Humanities**

**Area D: Social Sciences**

**Area E: Lifelong Learning and Self-Development**

**Area F: Ethnic Studies**

**CSU Graduation Requirement in U.S. History, Constitution and American Ideals:**

**IGETC**

**Area 1: English Communication**

**Area 2A: Mathematical Concepts & Quantitative Reasoning**

**Area 3: Arts and Humanities**

**Area 4: Social and Behavioral Sciences**

**Area 5: Physical and Biological Sciences**

**Area 6: Languages Other than English (LOTE)**

**Textbooks and Lab Manuals**

**Resource Type**

Textbook

**Description**

Dlestler (2020). *Becoming a Critical Thinker*. Pearson. (Boston, MA.)

**Resource Type**

Textbook

**Description**

Parker and Moore (2020). *Critical Thinking*. McGraw Hill Publishing. (NY/NY)

**Resource Type**

Textbook

**Description**

Boardman and Cavender (2018). *Logic and Contemporary Rhetoric*. Cengage. (Boston/MA)

## Distance Education Addendum

### Definitions

#### Distance Education Modalities

Hybrid (51%–99% online)

Hybrid (1%–50% online)

100% online

### Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

### Regular Effective/Substantive Contact

#### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Students will post a discussion board topic such as by distinguishing inductive (probabilistic) arguments as either Sound or unsound, and assess/ing the relative merits Or deficiencies exhibited by those arguments.
E-mail	Faculty will communicate with students via email regarding course information and concerns.
Other DE (e.g., recorded lectures)	Faculty may record audio recordings and/or video lectures on the course content including videos on metaphysics, epistemology, ethics, logic, social and political philosophy, theology, and/or axiology...within the context of each one's (relative) impact on the field of critical thinking/philosophy of science.
Video Conferencing	Faculty may utilize online live meetings with students to deliver lectures and have discussions on topics related to the course content.

#### Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Students will post a discussion board topic such as by distinguishing inductive (probabilistic) arguments as either Sound or unsound, and assess/ing the relative merits Or deficiencies exhibited by those arguments.
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Video Conferencing	Faculty may utilize online live meetings with students to deliver lectures and have discussions on topics related to the course content.

**100% online Modality:**

<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	Students will post a discussion board topic such as by distinguishing inductive (probabilistic) arguments as either Sound or unsound, and assess/ing the relative merits Or deficiencies exhibited by those arguments.
E-mail	Faculty will communicate with students via email regarding course information and concerns.
Other DE (e.g., recorded lectures)	Faculty may record audio recordings and/or video lectures on the course content including videos on metaphysics, epistemology, ethics, logic, social and political philosophy, theology, and/or axiology...within the context of each one's (relative) impact on the field of critical thinking/ philosophy of science.
Video Conferencing	Faculty may utilize online live meetings with students to deliver lectures and have discussions on topics related to the course content.

**Examinations****Hybrid (1%–50% online) Modality**

Online  
On campus

**Hybrid (51%–99% online) Modality**

Online  
On campus

**Primary Minimum Qualification**

PHILOSOPHY

**Review and Approval Dates****Department Chair**

09/19/2020

**Dean**

09/21/2020

**Technical Review**

10/28/2020

**Curriculum Committee**

10/28/2020

**Curriculum Committee**

11/25/2020

**CCCCO**

MM/DD/YYYY

**Control Number**

CCC000236471

**DOE/accreditation approval date**

MM/DD/YYYY