PHIL-2031: PHILOSOPHY OF SCIENCE

Cuyahoga Community College

Viewing: PHIL-2031 : Philosophy of Science
Board of Trustees:
March 2019

Academic Term:
Fall 2019

Subject Code
PHIL - Philosophy

Course Number:
2031

Title:
Philosophy of Science

Catalog Description:
Study of concept formation in science and examination of patterns of scientific investigation and method. Treatment of concepts such as observation, classification, causality, law of nature, explanation, and theory.

Credit Hour(s):
3

Lecture Hour(s):
3

Requisites
Prerequisite and Corequisite
ENG-1010 College Composition I, or ENG-101H Honors College Composition I.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis, which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.

For specific information pertaining to ADA accommodation, please contact your campus SAS office or visit online athttp://www.tri-c.edu/accessprograms/. Blackboard accessibility information is available athttp://access.blackboard.com.

Eastern (216) 987-2052 - Voice
Metropolitan (216) 987-4344 – Voice. (216) 987-4048 – TTY.
Western (216) 987-5079 – Voice. (216) 987-5117 – TTY.
Westshore (216) 987-3900 – Voice. (216) 987-4048 – TTY.
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III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status. Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Therefore, attendance is recorded in the following ways:
• For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
• For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College's Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available athttp://www.tri-c.edu/student-resources/documents/studenthandbook.pdfYou must also comply with the College's Zero Tolerance for Violence on College Property available athttp://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf

Outcomes
Course Outcome(s):
Analyze and explain philosophy of science concepts and their relationship to scientific inquiry.

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):
1. Evaluate the objectivity of observation claims.
2. Describe and appraise the logic of scientific classification.
3. Define and assess the concept of law of nature.
4. Critically analyze types of scientific explanation and criteria for their evaluation.

Course Outcome(s):
Apply philosophical conceptions and theory to a philosophical issue in science and successfully argue for a position taken on it.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Information Literacy: Acquire, evaluate, and use information from credible sources in order to meet information needs for a specific research purpose.
Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):
1. Describe and appraise the logic of scientific classification.
2. Interpret and analyze theories of causality.
3. Critically analyze types of scientific explanation and criteria for their evaluation.
4. Interpret and assess historical and contemporary scholarly articles written in the field of philosophy of science.

Course Outcome(s):
Comparatively evaluate the scholarship produced in the field of philosophy of science.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Information Literacy: Acquire, evaluate, and use information from credible sources in order to meet information needs for a specific research purpose.
Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):
1. Interpret and analyze theories of causality.
2. Define and assess the concept of law of nature.
3. Critically analyze types of scientific explanation and criteria for their evaluation.
4. Critically assess types of scientific theory and criteria for their evaluation.
5. Interpret and assess historical and contemporary scholarly articles written in the field of philosophy of science.

Methods of Evaluation:
1. Essay exams
2. Essay assignments
3. Research papers
4. Objective exams
5. Quizzes
6. Class participation

Course Content Outline:
1. Philosophy, science, and philosophy of science
   a. Historical precedents: the emergence of science from philosophy
   b. Branches of philosophy and divisions of science
      i. Philosophy of physical science
      ii. Philosophy of social science
      iii. Logical positivism
   c. Scientific method
      i. One method or a plurality of methods?
      ii. Competing accounts of the logic of method: deductive or inductive?
2. Observation and facts
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3. Classification
   a. Purposes for classification
   b. Qualitative and quantitative taxonomies
   c. Aristotle’s logic and criteria for classes
   d. Are there natural kinds?
   e. Relation to explanation and prediction

4. Explanation and prediction
   a. Explanations that don’t predict, and predictions that don’t explain
   b. Senses of “explain”
   c. Explanation using causal laws
      i. Hume’s view of causation
      ii. Mill’s views on causation
      iii. Causal laws in explanation and prediction
   d. Categorical and statistical explanations
      i. Carl Hempel’s deductive nomological model
      ii. Philip Kitcher’s Unification model
      iii. Role of the history of science
   e. Standards for explanations

5. Scientific theory
   a. Senses of the term “theory”
   b. Contrast between experimental laws and theoretical laws
   c. Standards for evaluating theories: Quine-Duhem’s underdetermination thesis
      i. Social constructivism
      ii. Thomas Kuhn: structure of scientific revolution
      iii. Criticisms of social constructivism
      iv. Feminist issues

6. Science and non-science
   a. Karl Popper on falsification
   b. Science and truth
   c. Application of criteria for observations, explanation, and theory to examples of non-science, e.g., astrology, superstition

Resources


"The British Journal for the Philosophy of Science"

"Foundations of Science"

"International Studies in the Philosophy of Science: I.S.P.S."

"Metascience"

"Perspectives on Science: Historical, Philosophical, Social"

"Philosophy of Science"

"Philosophy of Science"

**Resources Other**

1. Philosophy of Science: [http://www.indiana.edu/~philsci/](http://www.indiana.edu/~philsci/)
2. Philosophy of Science: [http://www.friesian.com/science.htm](http://www.friesian.com/science.htm)
5. What is Science: [http://hem.passagen.se/thebee/SCIENCE/Science.htm](http://hem.passagen.se/thebee/SCIENCE/Science.htm)

**Instructional Services**

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