

CHEM 101: SCIENCE IN THE PUBLIC DEBATE

In Workflow

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Approval Path

1. Fri, 16 Oct 2020 15:53:48 GMT
Thomas Savage (tjsavage): Rollback to Initiator
2. Tue, 20 Oct 2020 22:50:52 GMT
Thomas Savage (tjsavage): Rollback to Initiator
3. Tue, 20 Oct 2020 22:57:28 GMT
Thomas Savage (tjsavage): Approved for CHEM Committee Chair
4. Fri, 23 Oct 2020 03:12:36 GMT
Roy Dixon (rdixon): Approved for CHEM Chair
5. Wed, 04 Nov 2020 23:11:17 GMT
Thomas Krabacher (tsk): Approved for NSM College Committee Chair
6. Fri, 22 Jan 2021 19:34:39 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

New Course Proposal

Date Submitted: Tue, 20 Oct 2020 22:56:09 GMT

Viewing: CHEM 101 : Science in the Public Debate

Last edit: Tue, 20 Oct 2020 22:56:08 GMT

Changes proposed by: Thomas Savage (102041600)

Contact(s):

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Catalog Title:

Science in the Public Debate

Class Schedule Title:

Science in the Public Debate

Academic Group: (College)

NSM - Natural Sciences & Mathematics

Academic Organization: (Department)

Chemistry

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Spring 2021 (2021/2022 Catalog)

Subject Area: (prefix)

CHEM - Chemistry

Catalog Number: (course number)

101

Course ID: (For administrative use only.)

TBD

Units:

3

In what term(s) will this course typically be offered?

Fall, Spring

Does this course require a room for its final exam?

Yes, final exam requires a room

Does this course replace an existing experimental course?

No

This course complies with the credit hour policy:

Yes

Justification for course proposal:

Here we propose to offer a version of a current upper division Honors course (HONR 101, 'Science and the Public Good') to the general student population to meet area B5 general education requirements.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)

This course provides students with an introduction to the history, philosophy and practice of modern science, and examines how the social environment influences scientific analysis. Students apply this understanding to the critical evaluation of scientific sources in current social debates surrounding scientific topics.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Course Note: (Note must be a single sentence; do not include field trip or fee course notations.)

Does not fulfill credit requirements for the major or minor in chemistry.

Does this course have prerequisites?

Yes

Prerequisite:

ENGL 20

Prerequisites Enforced at Registration?

Yes

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Lecture

Lecture Classification

CS#02 - Lecture/Discussion (K-factor=1 WTU per unit)

Lecture Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes: Describe outcomes using the following format: 'Students will be able to: 1), 2), etc.'

The overall course learning objective is for students to apply an understanding of the history, philosophy and mechanics of modern scientific practice to critically evaluate scientific arguments of social concern.

More specifically students should be able to:

1. Describe the historical background of modern western science, including the role of pre-literate societies, Sumerians and Babylonians, Greek philosophers, the Arab Empire, Medieval universities, and the Scientific Revolution in the development of modern scientific philosophy and practice.
2. Discuss the philosophical basis of modern science including demonstrating an understanding of the strengths and weaknesses of scientific observation and logic and the role of falsification in the practice of science.
3. Critically evaluate causative arguments based on correlation, and describe the difference between Type I and Type II statistical errors.
4. Describe the modern practice of science, including how the scientific method is incorporated into modern science, where science is practiced, how science is funded and how scientific results are communicated.
5. Discuss how the social environment of practicing scientists can influence the analysis and interpretation of scientific data using specific examples from course readings.
6. Apply an understanding of the history, philosophy and practice of modern science to analysis of arguments concerning a current social issue.

Attach a list of the required/recommended course readings and activities:

CHEM 101 Required Reading.pdf

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.**Assessment Strategies:**

Midterm Examinations: Midterm examinations will be given following the review and discussion of the three required readings and will be a combination of short-answer and essay questions to assess the understanding of the content and themes of the readings. Midterms will be used to assess learning objectives 1-5.

Final Group Project: Students will work in teams to evaluate the sources of the scientific evidence addressing a significant contemporaneous public policy issue and make a joint presentation of their analysis. In addition, each individual will write a 2000 word summary to address (1) the substance of the arguments around the public policy issue, (2) the relative general acceptance of the argument (is there a scientific consensus around the issue?), and (3) the background and motivations of those making the arguments. The group project and summary are used to assess learning objective 6.

Short Assignments: Occasional short exercises will be provided throughout the course to assess (1) understanding of the fundamentals of the structure of the primary scientific literature (learning objective 4), and (2) critical analysis of course readings (learning objective 5).

For whom is this course being developed?

General Education

Is this course required in a degree program (major, minor, graduate degree, certificate?)

No

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Knowledge of human cultures and the physical and natural world

Personal and social responsibility

Intellectual and practical skills

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

Yes

In which GE area(s) does this apply?

B5. Further Studies in Physical Science, Life Forms and Quantitative Reasoning (Upper Division Only)

Which GE objective(s) does this course satisfy?

Read, write, and understand relatively complex and sophisticated English prose.

Find and use common information resources, engage in specialized library research, use computers and seek out appropriate expert opinion and advice.

Use mathematical ideas to accomplish a variety of tasks.

Gain a general understanding of current theory, concepts, knowledge, and scientific methods pertaining to the nature of the physical universe, ecosystems, and life on this planet.

Construct a non-fallacious verbal argument, recognize fallacious arguments, and follow the verbal arguments of others.

Attach Course Syllabus with Detailed Outline of Weekly Topics:

Generic Syllabus.pdf

Syllabi must include: GE area outcomes listed verbatim; catalog description of the course; prerequisites, if any; student learning objectives; assignments; texts; reading lists; materials; grading system; exams and other methods of evaluation.

Will more than one section of this course be offered?

No

General Education Details - Area B5: Further Studies in Physical Science, Life Forms and Quantitative Reasoning

Section 1.

Indicate in written statements how the course meets the following criteria for Category B5. Relate the statements to the course syllabus and outline. Be as succinct as possible.

Course type:

Physical Science or Life Forms

For courses in physical science or life forms:

Develops an understanding of the principles underlying and interrelating natural phenomena including the foundations of our knowledge of living systems.

By way of introducing students to the history, methodology and mechanics of science and how science relates to issues of social concern, students are introduced to the fundamentals of cosmology (in the History of Science section), anthropology and human biology (when discussing Gould's arguments in 'Mismeasure of Man'), and toxicology and other fields (when discussing the arguments in Oreskes and Conway). In addition the final project and paper requires students to become familiar with the scientific arguments behind one issue of current social concern (the specific topic will vary according to current events).

Introduces students to one or more of the disciplines whose purpose is to acquire knowledge of the physical universe and/or living systems and life forms.

Similarly, through introducing students to the history, methodology and mechanics of science and how science relates to issues of social concern, students are introduced to the fundamentals of cosmology (in the History of Science section), anthropology and human biology (when discussing Gould's arguments in 'Mismeasure of Man'), and toxicology and other fields (when discussing the arguments in Oreskes and Conway). In addition the final project and paper requires students to become familiar with the scientific arguments behind one issue of current social concern (the specific topic will vary according to current events).

Develops an appreciation of the methodologies of science and the limitations of scientific inquiry.

This is the fundamental goal of the course and is addressed throughout, with specific emphasis in the section on the methodology of science and the section on the philosophy of science.

Please Note: Courses listed in this category:

1) Need not be introductory courses and need not be as broad in scope as courses included in B1, B2, B3 or B4 i.e.; they may deal with a specialized topic.

2) These courses may have prerequisites or build on or apply concepts and knowledge covered in Areas B1, B2 and B4. For math courses, there must be an intermediate algebra prerequisite.

Addresses the specific GE student learning outcomes for area B5. A student should be able to do one or more of the following:

Cite critical observations, underlying assumptions and limitations to explain and apply important ideas and models in one or more of the following: physical science, life science, mathematics, or computer science.

When completing the final project of the course, students must achieve this objective as they explain the scientific arguments surrounding an issue of social concern and discuss the background and motivations of those making the arguments.

Recognize evidence-based conclusions and form reasoned opinions about science-related matters of personal, public and ethical concern.

This is a major objective of the course and when completing the final project, students must not only explain the scientific arguments surrounding an issue of social concern and discuss the background and motivations of those making the arguments, but also generate their own conclusions surrounding the issue .

Discuss historical or philosophical perspectives pertaining to the practice of science or mathematics.

This is another major objective of the course, and is specifically met in the sections on the history of science and philosophy of science.

Includes a writing component described on course syllabus

1) If course is lower division, formal and/or informal writing assignments encouraging students to think through course concepts using at least one of the following: periodic lab reports, exams which include essay questions, periodic formal writing assignments, periodic journals, reading logs, other. Writing in lower division courses need not be graded, but must, at a minimum, be evaluated for clarity and proper handling of terms, phrases, and concepts related to the course.

2) If course is upper division, a minimum of 1500 words of formal, graded writing. [Preferably there should be more than one formal writing assignment and each writing assignment (e.g. periodic lab reports, exams which include essay questions, a research/term paper etc.) should be due in stages throughout the semester to allow the writer to revise after receiving feedback from the instructor. Include an indication of how writing is to be evaluated and entered into course grade determination.]

The major writing assignment is the final project consisting of a oral and written presentations in which students summarize the scientific arguments surrounding a current issue of social concern, describe the background and motivation of those making those arguments, then provide their own opinion on the merit of the argument (see attached files for details). In addition, midterm examinations and some of the other exercises require 200 -1000 word essays.

Section 2.

If you would like, you may provide further information that might help the G.E. Course Review Committee understand how this course meets these criteria and/or the G.E. Program Objectives found in the CSUS Policy Manual, General Education Program, Section I.B.

See attached final project assignment.

Please attach any additional files not requested above:

Final Project Assignment.doc

Polysci Consult.pdf

Physics Consult.pdf

Honors Consult.pdf

Reviewer Comments:

Thomas Savage (tjsavage) (Fri, 16 Oct 2020 15:53:48 GMT): Rollback: update

Thomas Savage (tjsavage) (Tue, 20 Oct 2020 22:50:52 GMT): Rollback: more updates

Key: 14214