



Academic Affairs - Course Proposal

Form A

CALIFORNIA STATE UNIVERSITY, SACRAMENTO

Academic Unit: Liberal Arts		Department Chair: Jeffrey Brodd, Program Coordinator	
Type of Course Proposal: New___ Change_x_ Deletion___		Date: April 3, 2006	
Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes ___ No ___x___		For Catalog Copy: Yes_x_ No___	CCE: Yes___ No___
		Semester Effective: Fall___ Spring_x_ 2007___	
Prefix &No. LIBA 205	Title: Space and Time: Plato to Einstein		Units: 3
Change to:			
Prefix &No. LIBA 205	Title: Space and Time		Units: 3

JUSTIFICATION:

The Department would like more flexibility in offering this course. In particular we would like the option of offering an historically-oriented course or a problems-oriented course.

To do this, we'd like to delete these words from the previous course description: **PHIL 192D Space and Time: Plato to Einstein**. Introduction to philosophical issues involving space, time, and matter. The historical development of the issues from Antiquity (Zeno, Plato, and Euclid) through the Early Modern Period (Newton, Leibniz, Berkeley and Kant) to contemporary treatments (Einstein, Thorne, and Hawking). An investigation into current state of these issues. No background or work in mathematics or physics is required. **Prerequisite:** 6 units in philosophy or instructor permission. 3 units.

NEW COURSE DESCRIPTION: (Not to exceed 80 words, and language should conform to catalog copy.

See <http://www.csus.edu/acaf/univmanual/crspsl.htm> - Guidelines for Catalog Course Description

Introduction to significant philosophical issues involving space and time. An investigation into the current state of these issues. No background or work in mathematics or physics is required. Prerequisite: 6 units in philosophy or instructor permission. 3 units.	
Note:	
Prerequisite: 6 units in philosophy or instructor permission	
Corequisite:	
CAN (California Articulation Number):	
Graded: Letter ___x___ Credit/No Credit___	Instructor Approval? Yes___ No_x___
Course Classification: C5	Title for SIS+ (not more than 25 characters) Space and Time
Cross Listed? Yes ___ No_x___	If yes, with what course:

How Many Times Can This Course be Taken for Credit? once

FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc." See the example at <http://www.csus.edu/acaf/example.htm>

Students will be able to acquire a broad understanding of the major philosophical issues that involve the nature of space and time. They will know what is controversial about various important claims that have been made, and they will be able to carefully express and to defend their own views on these topics.

**Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.

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:

One homework assignment (20%), a midterm exam (25%), an eight-page essay (25%), and a comprehensive final exam (30%). Depth of philosophical insight, accuracy, and quality of argumentation are the paramount factors affecting the grades, but English writing skill is also a significant factor.

For whom is this course being developed?

Majors in the Dept Majors of other Depts Minors in the Dept General Education Other Grad

Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes No

If yes, identify program(s):

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes No

If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any). Phil 192D

The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.

Approvals: If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

Signatures:

Date

Department Chair:	
College Dean or Associate Dean:	
CPSP (for school personnel courses ONLY)	
Associate Vice President and Dean for Academic Programs	

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean's office to send original after approval to Jerri McAtee, at zip 6016. An electronic copy must also be sent to mcateejj@csus.edu.

College of Arts and Letters Curriculum Committee CHECK-OFF LIST FOR COURSE APPROVAL

Name of Department Liberal Arts Effective Date 4/3/06

Proposed Course Number LIBA205 Course Name Space and Time

Contact Person Brad Dowden Instructor Brad Dowden

Projected Enrollment 15 Units of Credit 3

Has the course been offered before? yes If yes, under what number? LIBA 205

Suggested Course Classification C5 Unit distribution: lecture lab
activity

List the prerequisite(s) for the proposed course.

6 units in philosophy or instructor permission

For which students or programs is the course designated?

Majors in the department

Minors in the department

Majors of other departments (*e.g., An A&L course designed for Business Administration majors*)

General service

Other (specify) Graduates Liberal Arts

If approved by the A & L Curriculum Committee, will this course be submitted for consideration in the General Education Program? Yes No

Method of Presentation:

Lecture Lecture/Activity Lecture/Discussion Lecture/Laboratory
 Activity Laboratory Seminar Films and/or other visuals
 Performance Other (specify)

If different amounts of credit will be available for the proposed course, indicate differences in course requirements for earning the units.

If the course can be taken more than one time for credit, what is the justification for the repetition? How will the two (or more) experiences differ? once only

What courses currently offered in Arts and Letters or other colleges/departments most closely resemble the proposed course? Please *list* these other courses and justify why the proposed course will not duplicate them. Not all approved courses are shown in the current catalog so please consult faculty/chair in other schools/departments where duplication might occur. Please list persons you consulted.

1. Philosophy 192D

3.

2.

4.

Can the course be implemented within the existing departmental allocation? yes

If the proposed course will require an expenditure of \$100 or more, append a breakdown of expenditure and source of funding.

If this is a new course, how will it be integrated into your present allocation:

1. Will you be giving up another course to make room for the proposed course?
2. What course(s) could you alternate in the schedule with the proposed course?
3. How often would you schedule the proposed course?
4. What full-time faculty can teach the course? What other course would they give up in order to teach it?
5. Realistically, what fiscal impact might the proposed course have? (*e.g., operating expense, faculty cost, staff cost, student assistants, equipment, etc.*)

List the objectives/goals/expected learning outcomes.

Students will be able to acquire a broad understanding of the major philosophical issues that involve the nature of space and time. They will know what is controversial about various important claims that have been made, and they will be able to carefully express and to defend their own views on these topics.

What student assessment tools will be used? (*e.g., exams, papers, portfolios.*)

One homework assignment (20%), a midterm exam (25%), an eight-page essay (25%), and a comprehensive final exam (30%). Depth of philosophical insight, accuracy, and quality of argumentation are the paramount factors affecting the grades, but English writing skill is also a significant factor.

In addition to filling out the Check-Off List form, please submit a course syllabus containing the following information: attached

- I. Course Content and Objectives
(Brief discursive overview of major topics and goals)
- II. Required Texts
(*e.g., textbooks, class handouts, journals, newspapers, web pages, videos, etc.*)
- III. Course Format
(*e.g., lecture, lecture-discussion, seminar, composition, activities, studio, etc.*)
- IV. Course Requirements
 - A. Class Participation
 - B. Examinations
 - C. Research Paper or Term Project or Short Papers, etc.
 - D. Attendance
 - E. Other Policies
- V. Student Evaluation: How are the requirements in IV weighted in determining the course grade?
(*e.g., attendance 10%, midterm 23%, etc.*)
- VI. Semester Outline
(Course topics ordered weekly)

Phil. 192D

Space and Time

Catalog description: Space and Time. Introduction to significant philosophical issues involving space and time. An investigation into the current state of these issues. No background or work in mathematics or physics is required. **Prerequisite:** 6 units in philosophy or instructor permission. 3 units.

Student outcome goals: The goal is for you to acquire a broad understanding of the major philosophical issues that involve the nature of space and time. You will know what is controversial about various important claims that have been made, and you will be able to carefully express and to defend your own views on these topics.

Grades: a homework assignment (20%), a midterm exam (25%), an eight-page essay (25%), and a comprehensive final exam (30%). Depth of philosophical insight, accuracy, and quality of argumentation are the paramount factors affecting the grades, but English writing skill is also a significant factor.

Textbook: *Travels in four Dimensions: The Enigmas of Space and Time*, by Robin Le Poidevin, Oxford University Press, 2003.

Late assignments, and make-up assignments: There are no make-ups. I accept late homework and essays. Late assignments can be turned in by email. There is a late penalty that increases by one-third letter grade for each 24-hour period it is late.

Disabilities: If you have a documented disability and require accommodation or assistance with assignments,

tests, attendance, note taking, etc., please see me early in the semester so that appropriate arrangements can be made to ensure your full participation in class. Also, you are encouraged to contact the Services for Students with Disabilities (Lassen Hall) for additional information regarding services that might be available to you.

More detailed course description: This is a seminar in metaphysics and the philosophy of science which focuses on issues involving space and time. We will cover a range of controversial topics from Zeno's Paradoxes of Ancient Greece to 21st century theories of quantum gravity. Here are examples of some of the philosophical issues we will investigate:

- If all matter and energy were removed from all space everywhere, would empty space still be left, or would nothing at all be left?
- Are there really "kinds of time," such as clock time, perceived time, and biological time?
- Time appears to have an arrow, to "unfold" in a direction; but if that arrow reversed direction in some far off corner of the universe, would the people there walk backwards up steps while remembering the future?
- Which kinds of time travel are possible?
- What features of space can be known *a priori*, that is, by pure thought?
- Is our current belief that space is a continuum and not atomistic merely an assumption, or is there empirical evidence for the belief?

The relevant scientific theories will be introduced as needed, but only qualitatively.

Schedule of Topics and Assignments: The schedule of weekly reading assignments and course topics is [here](#).

Week 1

Survey of the issues and topics.

Reading: "What Should a Philosophical Theory of Time Do?" at <http://www.iep.utm.edu/t/time.htm>

Week 2

One or many kinds of time?

Reading: "How is Time Related to Mind?" and "What is Time?" at <http://www.iep.utm.edu/t/time.htm>

Reading: Chapters 1 and 2 in the Poidevin text.

Week 3

Absolute vs. relational theories of space.

Reading: Chapter 3 of Poidevin.

Reading: "Implications of Mach's solution to Newton's bucket problem."

The edge of space and the beginning and end of time.

Reading: Chapters 4, 5 and 6 of Poidevin.

Week 4

What have we learned from Zeno's Paradoxes?

Reading: Chapter 7 of Poidevin.

Reading: "Zeno's Paradoxes," by Nick Huggett, *Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/paradox-zeno/>

Week 5

Presentism, McTaggart, and the passage of time.

Reading: "The Unreality of Time" by J.M.E. McTaggart, in *Mind*, 1908.

Reading: Chapter 8 of Poidevin.

Reading: "Does Time Flow?" at <http://www.iep.utm.edu/t/time.htm#H7>

Week 6

The continuum of space and the atoms of space.

Reading: Chapter 9 of Poidevin.

Midterm

Week 7

Time travel backward and forward.

Reading: "Time Travel" at The Internet Encyclopedia of Philosophy.

Reading: Chapter 10 of Poidevin.

Reading: "The Return of the Eternal Return" by P. Davies, pp. 36-38 of *About Time*.

Week 8

The arrows of time.

Reading: Chapter 12 of Poidevin.

Reading: "What gives time its direction or arrow?" at <http://www.iep.utm.edu/t/time.htm#H8>

Reading: "Penrose's solution to the Loschmidt problem."

Week 9

Kant's views on space and time.

Reading: "Concerning the Ultimate Foundation of the Differentiation of Regions in Space," in Huggett, ch. 11, online.

Reading: "Kant on Space and Geometry," pp. 221-234 in Huggett, online.

Week 10

Non-Euclidean geometries and Poincare's conventionalism.

Reading: "Beltrami, Klein, and the relative consistency of Riemannian geometry."

Reading: "Intrinsic curvature without an embedding space."

Reading: "The Nature of Geometry," in *The Rise of Scientific Philosophy*, by H. Reichenbach, 1951, pp. 125-139.

Week 11

Minkowski space-time and special relativity.

Reading: "The Ether" by Leonard Mlodinow, excerpted from *Euclid's Window: The Story of Geometry from Parallel Lines to Hyperspace*, handout.

Reading: "The Relativity of Simultaneity" by Albert Einstein from *Relativity*, pages 25 and 26, handout.

"Relativity" by Lawrence Bornstein and George Gamow (read from the beginning only through the section "Special Relativity"), handout.

Week 12

General Relativity.

Reading: "Relativity" by Lawrence Bornstein and George Gamow (read from "General Relativity" to the end), handout.

Reading: "The Horizon Problem and the Big Bang" by George Johnson and Joao Magueijo, excerpt from *The New York Times Book Review*, Feb. 9, 2003.

Week 13

Other times and spaces. The multi-verse of parallel universes.

Reading: Chapter 11 of Poidevin.

Reading: "Parallel Universes," by Max Tegmark, *Scientific American*, May, 2003, selected parts.

Reading: "A Brief History of the Multiverse," by Paul Davies, *The New York Times*, April 12, 2003.

Week 14

Tenseless and tensed theories of time.

Reading: "Are there essentially tensed facts?" at <http://www.iep.utm.edu/t/time.htm#H10>

Reading: "Tense and aspect," by Mark Steedman, online.

Week 15

Review

Film: "It's About Time."