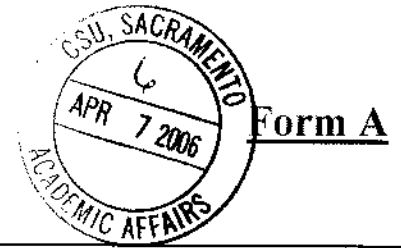




ALS

# Academic Affairs - Course Proposal



CALIFORNIA STATE UNIVERSITY, SACRAMENTO

<b>Academic Unit:</b> Philosophy		<b>Department Chair:</b> Thomas Pyne	
<b>Type of Course Proposal:</b> New    Change <input checked="" type="checkbox"/> Deletion		<b>Date:</b> March 28, 2006	
<b>Does this course fulfill a requirement for single-subject or multiple subject credential students?</b> Yes    No <input checked="" type="checkbox"/>		<b>For Catalog Copy:</b> Yes <input checked="" type="checkbox"/> No	<b>CCE:</b> Yes    No
		<b>Semester Effective:</b> Fall    Spring <input checked="" type="checkbox"/> 2007	
<b>Prefix &amp; No.</b> PHIL 192D	<b>Title:</b> Space and Time: Plato to Einstein	<b>Units:</b> 3	
<b>Change to:</b>			
<b>Prefix &amp; No.</b> PHIL 192D	<b>Title:</b> Space and Time	<b>Units:</b> 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: ~~PHIL192D. 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/acad/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  Credit/No Credit

**Instructor Approval?** Yes    No

**Course Classification:**

**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

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

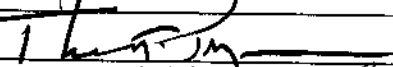

If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any). LIBA 205

*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: 	3/30/06
College Dean or Associate Dean: 	4-6-06

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 [mcateeji@csus.edu](mailto:mcateeji@csus.edu).**

# Phil. 192D

## Space and Time

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**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](#).

## Weekly Topics and Readings for Phil. 192D

### 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."