



SACRAMENTO  
STATE

# Course Change Proposal Form A

<b>Academic Group (College):</b> NSM	<b>Academic Organization (Department):</b> Mathematics/Statistics	<b>Date:</b> 09/18/06
<b>Type of Course Proposal:</b> New <input checked="" type="checkbox"/> Change <input type="checkbox"/> Deletion <input type="checkbox"/>	<b>Department Chair:</b> Roger Leezer	<b>Submitted by:</b> Gary Shannon
<b>Does this course fulfill a requirement for single-subject or multiple subject credential students?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>For Catalog Copy:</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> <b>CCE:</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Semester Effective:</b> Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> 2007

<b>This course replaces experimental course Subject Area (prefix) and Catalog Number (course number):</b>	
<b>This Catalog Number (course number) is being replaced:</b>	

**Change from:**

<b>Subject Area (prefix) &amp; Catalog No. (course no.):</b>	<b>Title:</b>	<b>Units:</b>
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**Change to:**

<b>Subject Area (prefix) &amp; Catalog No. (course no.):</b> Math 196H	<b>Title:</b> An Integrated Course in Mathematics & Child Development	<b>Units:</b> 3
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**JUSTIFICATION:**

One of the two integrated courses for Liberal Studies. The Liberal Studies Major requires that students take an integrated studies course, and only one such course presently is offered. Math 196H is an experimental course designed to develop a second integrated studies course.

**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)

Students will build on their understanding of the material of Math 17, 107AB by deepening their understanding of the concepts taught in these courses. This will be done by closely examining these concepts in relationship to theories of intellectual development. In particular, students will examine mathematical concepts related to K-8 with respect to Nativism, Information Processing, and Constructivism, and throughout the course will consider the questions of "What is Mathematics?" and "How is Mathematics learned?"

**Note:**

**Prerequisite:** Math 17, 107A, 107B and ChDv 30

**Corequisite:**

**CAN (California Articulation Number):**

**Graded:** Letter  Credit/No Credit  **Instructor Approval Required?** Yes  No

**Course Classification (e.g., lecture, lab, seminar, discussion):**  
C2 (lecture) **Title for SIS+/CMS (not more than 30 characters)**  
Integrated Course Math & ChDv

**Cross Listed?** Yes  No  **If yes, do they meet together and fulfill the same requirement, and what is the other course.**

**How Many Times Can This Course be Taken for Credit?** one time

**Can the course be taken for Credit more than once during the same term?** Yes  No

Math 196H  
An Integrated Course in Mathematics and Child Development

Catalog Description

Students will build on their understanding of the material from Math 17, 107A, 107B by deepening their understanding of the concepts taught in these courses. This will be done by closely examining these concepts in relationship to theories of intellectual development. In particular, students will examine mathematical concepts related to K-8 with respect to Nativism, Information Processing, and Constructivism, and throughout the course will consider the questions of "What is Mathematics?" and "How is Mathematics learned?" Grading will be based on Homework, presentations, exams.

The primary focus of the course will be on the mathematical concepts, and on deepening the students' understanding of these concepts. These concepts will be considered in the light of the social and cultural practices that may be used in the classroom, and how these practices promote mathematics learning and development. Prerequisites: Math 17, Math 107A and Math 107B.

Course Outline

The course will consist of selected topics from Math 17, 107A/B, but will include the following (and each of these will be interwoven with related developmental questions):

1. Why the algorithms for addition/subtraction/multiplication/division/exponentiation work -- with some consideration of other algorithms.
2. The relationship between perimeter and area; between surface area and volume (with an understanding of why the formulas for the perimeter, area and volume of common geometric objects hold.
3. The development of the number line; how numbers, relations, and operations can be represented on the number line.
4. van Hiele's model for the development of geometric thought - which builds from the visual level to the descriptive level to the theoretical level - and includes having the learner work through a variety of activities and ideas in the process from moving from one level to another.
5. Ideas in probability and statistics and how a child's understanding of these ideas is affected by development.

Additional readings will include the following:

An excerpt from the Meno, by Plato  
Piaget's ideas related to the "Zone of Proximal Development."  
Vygotsky's ideas regarding mathematics and development  
"Knowing and Teaching Mathematics," by Liping Ma  
Readings on Cultural Practices and Mathematics Learning and Development  
"On Becoming a Reflective Mathematics Teacher," by Artzt & Amour-Thomas  
"The Construction Zone: Working for Cognitive Change in School," (Newman, Griffen & Cole), 1993.

This course is part of the Liberal Studies elementary subject matter program for students who are preparing to become K-8 teachers in California. This course provides important subject matter study in the mathematics and child development portion of the curriculum.

## 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:

- 1) Explain the relationship between developmental perspective and learning/instructing children in mathematics.
- 2) Develop an understanding of why various mathematical algorithms work and explore why this understanding is crucial to pedagogy.
- 3) Construct formulas for the perimeter, area and volume of common geometric objects, and explain how the process of constructing these formulas is related to learning practices.
- 4) Demonstrate how numbers, relations, and operations can be represented on the number line, and explain how an understanding of the number line can be transformed into mathematical instruction for children.
- 5) Examine geometric ideas using van Hiele's model and show how this model can be used for instruction from a developmental perspective.

\*\*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:

Homework, Exams, Presentations will be used.

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). Liberal Studies

*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:

Department Chair:

*Signatures*

Date

9/18/06

College Dean or Associate Dean:

*Signature*

10/5/06

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 Academic Affairs, at mail zip 6016. An electronic copy must also be sent.