

Glassboro State College Senate Curriculum Committee

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Approval Form 4901.503

Proposal Title: Seminar on Integrating Mathematics & Science

Sponsor(s) J. Caldwell and others (see list) Dept.: Mathematics Ext. 6513
(Interdisciplinary Course)

Check one: Course Specialization Concentration Minor Achievement Certificate
 Certification Program Major Program Minor Change
(please name deletion or credit/title/catalog change)

Undergraduate Graduate 3 Credit Hours

<p>Step 1 (Department)</p> <p><input checked="" type="checkbox"/> Approved <u>10-1-93</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>J. Caldwell</u> Dept. CC Chairperson</p> <p><input type="checkbox"/> Reviewed _____ Date</p> <p><u>J. Caldwell, Chairperson</u> SSI Committee Dept. Chairperson</p>	<p>Step 2 (Receipt)</p> <p><input type="checkbox"/> SCC# <u>93-96-28</u></p> <p>Proposal Received _____ Date</p> <p><u>Oct 10 1993</u></p> <p><u>Mary L. Putman</u> SCC Chairperson</p>	<p>Step 3 (School CC)</p> <p>Reviewed <u>11/4/93</u></p> <p><input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not Approved</p> <p>Comments: <u>With revisions of pages 1 and 2. These revisions have been accepted by Janet Caldwell via phone conversation.</u></p> <p><u>Jeanne Scott</u> School Curr. Comm. Chairperson</p>
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Step 4 (Academic Dean) **Comments:**

Recommend
 Not Recommend
 Conditionally Recommend (see comments)

Reviewed _____
Date

Signature, Dean of School

Step 5 (SCC)

Open Hearing 11/15/93 Approved by Senate Curriculum Committee 12/3/93
Date Date

Returned to sponsor(s) for the following reasons:

Step 6 (Senate)

Presented to Senate 12/10/93 Approved Not Approved
Date

Notification to Executive Vice-President/Provost 12/13/93 Mary L. Putman
Date Signature, SCC Chairperson

Step 7 (Executive V.P./Provost)

Received _____
Date

Approved Yes No

If no, reasons are as follows:

Student credit hours _____

Faculty load hours _____

Equalized credit hours _____

Official copy and approval sheet filed 12/1/93
Date

[Faint signature and text]

Signature, Executive Vice-President/Provost

Registrar

Approved course description received 14 Feb 94
Date

Hegis Taxonomy and Course Number assigned 4901.503

B F Kelsey
Signature, Registrar

14 Feb 94
Date

Notification forwarded:

- Senate Curriculum Committee Chairperson
- Department Chairperson(s)
- Academic Dean(s)
- Registrar
- Sponsor(s)

COURSE PROPOSAL

Seminar on Integrating Mathematics and Science

1. Details

- a. Course Title: Seminar on Integrating Mathematics and Science
- b. Sponsor(s): Janet Caldwell, Mathematics
Robert Blough, Elementary Education
Louis Molinari, Elementary Education
Karen Magee-Sauer, Chemistry and Physics
Joanne Scott, Life Sciences
- c. Credit Hours: 3
- d. Course Level: Graduate
- e. Curricular Effect: Part of a new emphasis strand in Master's in Elementary Education. Students initially will be participants in New Jersey's Statewide Systemic Initiative (funded by the National Science Foundation). It is anticipated that this courses will be required for a new state certification as a K-8 mathematics/science/technology specialist. Presently, this course may be used as electives in the Master's in Elementary Education.
- f. Prerequisites: Six semester hours in mathematics and six semester hours in science, at the graduate or undergraduate level.
- g. Suggested Time and Scale of Implementation: To be offered each spring, beginning in 1994.
- h. Adequacy of Resources: For at least the first five years, this course will be funded through a grant. Present resources are adequate for teaching the course. Faculty from a variety of disciplines will be encouraged to teach this course. At the conclusion of the grant period, the course will be administered by the Department of Elementary Education. The frequency of its offering will depend upon demand.

2. Rationale

This course will be the first of three to be offered as part of the Statewide Systemic Initiative in elementary mathematics and science. As part of this statewide program, Rowan faculty have developed a series of three advanced graduate-level, interdisciplinary courses to be offered each spring, summer, and fall. It is anticipated that these courses will form the core experience for an elementary mathematics/science endorsement to the state K-8

teaching certificate. These courses build on the participants' expertise in mathematics and/or science to develop leadership skills in integrating mathematics and science.

This course will initially be administered through the SSI grant. At the end of the grant period, the course will be administered by Elementary Education.

3. Essence of the Course

This course involves the students in examining several issues or themes from the viewpoints of scientists and mathematicians. Some possible themes include the following:

- Pollution
- Population growth
- Global warming
- Diminishing resources (ecosystems, rainforest)
- Management of waste products (recycling, etc.)
- Production of food
- Production of energy
- Controlling nature (hurricanes, volcanoes, weather, etc.)
- Health care (costs, disease, fitness)
- Food (costs, diet, nutrition)
- Monsters in the movies (special effects)
- Symmetry and shape
- Forensics (finding out the facts, chemical analysis, etc.)
- Music
- Sports
- How does it work? (machines)
- Structures
- Motion/transportation

Background information for each of these problems or themes will be provided through hands-on workshops given by faculty in the sciences and mathematics. For example, the issue of recycling may be examined from the point of view of a biologist, a chemist, an engineer, and a mathematician. Subsequently, teachers in the group will discuss appropriate activities for different grade levels, developing their own units, activities, and assessments for use in their schools.

a. Objectives

Students in this course will be able to:

- apply research skills in learning about specific issues in science, mathematics, and technology.
- apply the viewpoints of several fields of science to an issue or theme.

- develop interdisciplinary activities and units for use with students in grades K-8.

- field test and revise activities and units.

- recognize how technology incorporates science and mathematics.

b. Topical Outline/Content

The specific topics/issues/themes addressed will vary, depending upon recent news events and faculty and student interests. Issues will be selected with consideration for their appeal to elementary school children and their applicability across the sciences.

c. Evaluation and Grading

Students in the course will receive a grade based on the units developed in cooperative groups, activities developed individually, and/or more traditional quizzes. Activities and units will be evaluated as written papers and as oral presentations.

d. Course Evaluation

The course will be evaluated by an outside evaluator on an ongoing basis as part of the Statewide Systemic Initiative. In addition, faculty will use formative evaluations each semester to improve the course.

4. Results of Consultations

This course is brought forward as an interdisciplinary course, sponsored by Elementary Education, Mathematics, Chemistry and Physics, and Life Sciences.

6. Catalog Description

Seminar on Integrating Mathematics and Science

(Prerequisite: 6 sh of mathematics, 6 sh of science at undergraduate or graduate level)

This interdisciplinary seminar is designed for advanced graduate students with some background in teaching mathematics and/or the sciences at the elementary and/or middle school level. Students in the course will examine a number of current scientific issues from the perspective of different sciences and develop and pilot instructional activities relating to those issues.