

39

Approval Form

Proposal Title: Topics in Elementary Mathematics

Sponsor(s) Dr. Janet Caldwell Dept.: Math/Computer Science Ext. 6513

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>2/10/88</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>Ronald J. Zocher</u> Dept. CC Chairperson</p> <p><input type="checkbox"/> Reviewed <u>2/10/88</u> Date</p> <p>_____ Dept. Chairperson</p>	<p>Step 2 (Receipt)</p> <p><input type="checkbox"/> SCC# <u>87-88-52</u></p> <p>Proposal Received <u>2/10/88</u> Date</p> <p><u>Brenda A. Boley</u> SCC Chairperson</p>	<p>Step 3 (School CC)</p> <p>Reviewed <u>3/8/88</u></p> <p><input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not Approved</p> <p>Comments:</p> <p><u>A. L. + C. Shurr</u> School Curr. Comm. Chairperson</p>
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Step 4 (Academic Dean) **Comments:**

Recommend
 Not Recommend
 Conditionally Recommend (see comments)

Reviewed 3-16-88
Date

Signature, Dean of School

Step 5 (SCC)

Open Hearing 4/11/88 Approved by Senate Curriculum Committee 4/26/88
Date Date

Returned to sponsor(s) for the following reasons:
No representation - reschedule !!
Rescheduled 4/26/88

Step 6 (Senate)

Presented to Senate 5/6/88 Approved Not Approved
Date

Notification to Vice-President for Academic Affairs 5/10/88 Brenda A. Boley
Date Signature, SCC Chairperson

Step 6 (Senate)

Received 5/10/00
Date

Approved YES No

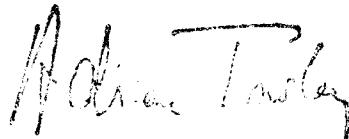
If no, reasons are as follows:

Student credit hours 3

Faculty load hours 3

Equalized credit hours 3

Official copy and approval sheet filed 6/15/02
Date



Signature, Vice-President for Academic Affairs

Registrar

Approved course description received 5/10/00
Date

Hegis Taxonomy and Course Number assigned 112-1000

[Signature]
Signature, Registrar

6/15/02
Date

Notification forwarded:

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

COURSE PROPOSAL

Topics in Elementary Mathematics

I. DETAILS

- a. **Course Title:** Topics in Elementary Mathematics
- b. **Sponsor:** Dr. Janet H. Cladwell, Mathematics & Computer Science
- c. **Course level:** Graduate (not open to undergraduates)
Credit hours: 3 s.h.
- d. **Curricular Effect:** Free Elective
- e. **Prerequisites:** None
- f. **Suggested time and scale of implementation:** This course can be implemented as soon as approved without additional staffing. It is anticipated that the course might be offered one to three times each year, perhaps on a service contract basis.
- g. **Adequacy of present resources:** Present faculty are available to teach this course; no additional resources will be required.

2. Rationale

Recent reports have been severely critical of mathematics instruction at all levels in the educational system. Typically, most elementary school teachers are minimally prepared in mathematics at the undergraduate level. In the past three years, the Department has discovered, through McSiip activities, a need for continuing education in mathematics at the post-baccalaureate level for these elementary teachers.

These teachers are not interested in the usual undergraduate course in mathematics, although their prior knowledge of mathematics usually indicates that they are functioning at that level. Nor are they seeking an education course in the teaching of mathematics, since these already exist at Glassboro. What mathematics content - its concepts and skills - in an educational setting that recognizes their maturity, their experience, their ability to deal with abstract concepts, their desire for some independent work, and their need to apply what they learn to their work.

3. Essence of the Course

a. The general objectives of the course are as follows:

The Student will:

1. Increase his/her knowledge and understanding of mathematical reasoning: quantitative, spatial, inductive and deductive.
2. Analyze mathematical systems such as the real numbers, finite geometries, non-Euclidean geometries, or those of abstract algebra.
3. Use various types and styles of mathematical communication, including explanations, proofs, examples and nonexamples, and problem solutions.
4. Research and apply mathematical concepts to problems in selected situations.
5. Develop an appreciation for mathematical reasoning.
6. Understand and appreciate the interrelationships of various areas of mathematics, such as algebra, geometry, and analysis.

b. Topical Outline/Content

Topics to be considered in this course will be selected from the following outline:

I. Quantitative Reasoning

- A. Comparison of numbers
- B. Comparison of quantitative measure
- C. Composition and decomposition of numerical values
- D. Construction of numerical sequences
- E. Classification of numbers by quantitative properties
- F. Estimation, graphing, and counting techniques
- G. Progressions
- H. Topics from number theory
- I. Additional topics from probability

II. Spatial Reasoning

- A. Figural classifications, similarities, sequences, and analogies
- B. Spatial perceptions
- C. Geometric concepts and principles

III. Inductive and Deductive Reasoning

IV. Mathematical Systems

- A. Development of the real number system
- B. Finite geometries
- C. Non-Euclidean geometries
- D. Abstract algebra

V. Communication in Mathematics

- A. Proof
- B. Types and styles of oral and written communication
- C. Explanation of concepts and algorithms
- D. Examples and nonexamples
- E. Problem solutions

c. Evaluation and Grading Procedures

All students will be graded on a letter-grade basis. Grades will be based on performance on assignments, projects, and tests.

d. Course Evaluation

Student evaluations will be analyzed for each offering of the course, with appropriate modifications made for subsequent offerings. Instructors' comments will also be solicited as the course develops.

The status of the course and all evaluations to date will be reviewed by the Mathematics & Computer Science department on an annual basis for the first three years. After that time, the course will be included in the customary program reviews.

4. Results of Consultation

a. Parties Consulted:

Tom Gallia, Secondary Education
Lou Molinari, Elementary Education
Minna Doskow, Dean of Arts & Sciences
Mathematics Department Faculty

6. Catalog Description

1703.600 Topics in Elementary Mathematics (3 sh graduate)

This course is designed to improve the understanding and attitudes of elementary teachers (K-8). Specific topics to be addressed include quantitative reasoning, spatial reasoning, inductive and deductive reasoning, mathematical systems, and communication in mathematics. Students will be expected to do an independent project in mathematics.

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GLASSBORO STATE COLLEGE

School of Professional Studies Glassboro, New Jersey 08028-1760 (609)863-5241

Office of the Dean

M E M O R A N D U M

TO: Dr. Janet H. Caldwell, Mathematics/Computer
Science Department

FROM: Thomas J. Gallia, Special Assistant to the Dean 

DATE: February 11, 1988

RE: Course Proposal: Topics in Elementary Mathematics

Dear Janet:

Thanks so much for the opportunity to review your proposed course noted above. The concept behind this course is an excellent one, practicing elementary teachers can be served very well by an indepth study of quantitative and spacial reasoning, inductive and deductive logic, etc.

One of the things you might consider is discussing with Dr. Louis Molinari the applicability of this course to the Elementary Education graduate program and/or the Post-BA Achievement Certificate in Elementary Mathematics Education.

This course is also well suited as an off-campus offering for school districts desiring to improve the mathematical competency of their K-8 staff.

Once again, I enthusiastically support your proposal and appreciate the opportunity to provide this input.

TJG/kls



GLASSBORO STATE COLLEGE

Dean of Liberal Arts & Sciences

Glassboro, New Jersey 08028-1772 (609) 863-5342

February 2, 1988

To the Faculty Senate Curriculum Committee,

I am writing in support of the course entitled "Topics in Elementary Mathematics." This is a graduate course intended for elementary school teachers who are certified and presently teaching in the schools.

As numerous national reports have indicated, mathematics instruction at all levels in the primary and secondary schools of our nation needs improvement. We have too few students interested in continuing their education in mathematics, and as a result, there is a shortage of mathematics teachers, engineers and others in mathematics related professions. If we are to answer our nation's need in this field, we must begin by getting students interested in mathematics in the elementary school. We can do so only if elementary school teachers are themselves well-trained in mathematics and capable of motivating and instructing their students to achieve at a high level. Unfortunately, most elementary school teachers do not have the subject matter background to do so.

MCSIIP has addressed itself to supplying mathematics and computer science background to teachers through a variety of activities, including graduate instruction especially tailored to improve the understanding and mastery of mathematics concepts and skills of elementary and secondary school teachers. These courses, such as "Topics in Elementary Mathematics," present the concepts and skills that teachers need in a context appropriate to their positions, maturity, and level of knowledge. Neither an ordinary graduate course in mathematics, in which the content addressed would be appropriate to graduate level mathematicians, nor an undergraduate course in mathematics, which is geared toward the undergraduate mathematics major and not the teacher and which is organized to address students with a different level of maturity and no professional experience, meets the needs of the teachers whom MCSIIP is serving. The proposed course, however, does precisely address those needs in mathematics. Therefore, I strongly support its adoption.

Sincerely yours,

Minna Doskow
Dean