

Faculty Senate Curriculum Committee

Approval Form

Proposal Title: Minor in Mathematics

Sponsor(s): Ronald J. Czocho Dept.: Math / Computer Science

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

Undergraduate Graduate 21 Credit Hours

<p>Step 1 (Department)</p> <p><input checked="" type="checkbox"/> Approved <u>4/3/86</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>L. E. Bergmann</u> Dept. CC Chairperson</p> <p><input checked="" type="checkbox"/> Reviewed <u>4-3-86</u> Date</p> <p><u>[Signature]</u> Chairperson, Dept.</p>	<p>Step 2 (Receipt)</p> <p>SCC# <u>85-86-87</u></p> <p>Proposal Received <u>04/07/86</u> Date</p> <p><u>Brenda A. Bolay</u> Chairperson, SCC</p>	<p>Step 3 (School CC)</p> <p>Reviewed <u>4/21/86</u> Date</p> <p><input checked="" type="checkbox"/> Approved</p> <p><input type="checkbox"/> Not Approved</p> <p>Comments:</p> <p><u>[Signature]</u> Chairperson, School Curr. Comm.</p>
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Step 4 (Academic Dean) **Comments:**

Reviewed 4/24/86
Date

[Signature]
Signature, Dean of School

Step 5 (SCC)

Open Hearing 5/14/86
Date

Approved by Senate Curriculum Committee 5/14/86
Date

Returned to sponsor(s) for the following reasons:

Step 6 (Faculty Senate)

Presented to Faculty Senate : 5/21/86
Date

Approved Not Approved

Justification to Vice-President Academic Affairs 5/21/86
Date

Brenda A. Bolay
Signature, SCC Chairperson

Step 7 (Vice-President for Academic Affairs)

Received 5/22/06
Date

Approved Yes No

If no, reasons are as follows:

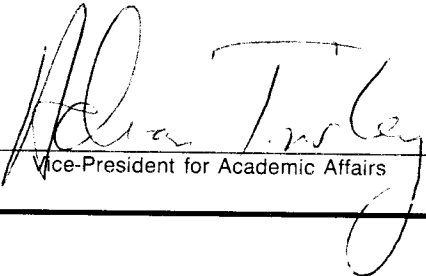
*NIKON IN MATH
DELETE CONCENTRATION*

Student credit hours NA

Faculty load hours NA

Equalized credit hours NA

Official copy and approval sheet filed _____
Date

Signature 
Vice-President for Academic Affairs

Registrar

Approved course description received _____
Date

Hegis Taxonomy and Course Number assigned _____

Signature _____
Registrar Date

Notification forwarded: Senate Curriculum Committee Chairperson, Department Chairperson(s), Academic Dean(s), Registrar, Sponsor(s).

PROPOSAL FOR AN UNDERGRADUATE MINOR IN MATHEMATICS

I. DETAILS

- A. Title: Minor in Mathematics
- B. Sponsors: Dr. Ronald J. Cochran, Asst. Professor
Department of Mathematics and Computer Science
- C. Scope or Size of the Program: This Minor will serve about thirty students in its first year.
- D. Relationship to Curriculum: The Mathematics Minor will function effectively in conjunction with major programs such as Administrative Studies, Communications, Computer Science, Geography, Education, Economics, Political Science, Sociology and Psychology. The Minor will enrich the Liberal Arts program, aid the State and region in solving the shortage of people trained in Mathematics and enhance the viability of other programs.
- E. Eligibility: Any non-math major may take this Minor.
- F. Implementation: The courses in this Minor are operational; the Minor can be implemented by September, 1986.
- G. Resource Requirements: Equipment, classrooms, faculty, and library, are adequate to support this Minor.

II. RATIONALE

Mathematics is unique in that it is the only scholarly area concerned with the abstract quantification and solution of problems from every sphere of human endeavor. Three vital areas that are influenced by Mathematics are the Sciences, Business, and Computer Science.

One way to illustrate the importance of Mathematics is to list some representative questions that it can help answer:

1. What determines the extent of unemployment?
2. What are the causes of recession and inflation, and how can mathematics be used to control them?
3. Is a deficit budget harmful under all models and circumstances?
4. Why should we expect technology and mathematics to produce socially desirable effects?
5. What are the statistical and probabilistic problems associated with environmental pollution?
6. What mathematical areas contribute to solving our

energy problems?

7. What are the causes of certain natural phenomena and how does mathematics aid in using them?

These sample questions make it obvious that practically everyone should know something about Mathematics in order to be able to function responsibly and effectively as a citizen, administrator, worker, or consumer.

The study of Mathematics also enables a person to understand the nature and functioning of different mathematical systems and the process of solving problems related to these areas. Moreover, the increasing need for mathematical analysis of modern day problems will provide good employment opportunities for mathematically trained individuals in government and international agencies, education, business, and industry. People trained in mathematics will be needed to solve many of the technical problems of the future.

The Minor in Mathematics will encourage and facilitate the acquisition of mathematical skills and concepts by a larger segment of the students at the College. It will thus provide an added dimension to the student's choice in developing a total program to meet his or her goals.

III. ESSENCE OF THE MINOR IN MATHEMATICS

A. Goals of the Program

1. The minor will enhance a student's broad educational background while providing a fundamental understanding of the place of Mathematics in our modern world. Through this preparation a student can select from numerous careers or graduate education in which a bachelor's degree supported by a Mathematics Minor is highly marketable.

2. The minor will provide the relevant background for and a basic understanding of the mathematical problems that arise in a technological and information based society.

3. The minor will provide an understanding of the changes in the applications of mathematics necessary to cope with the future challenges facing our region and nation.

B. Structure of the Program

The goals of the minor will be achieved through a combination of required and elective courses. The required core courses provide a common basis of study so that the individual goals of each student can then be addressed in the advanced elective courses. A student

wishing to Minor in Mathematics must take 21 semester hours including 15 semester hours in required core courses and 6 semester hours in either applied mathematics or theoretical mathematics. The choice of applied or theoretical coursework depends on the student's goals and should be decided in consultation with the department chairperson or the mathematics advisement coordinator.

1. The required core of 15 semester hours:

1701.130 - CALCULUS I
1701.131 - CALCULUS II
1701.132 - CALCULUS III
1701.210 - LINEAR ALGEBRA

2. Applied Mathematics option: two of the following:

1702.360 - INTRODUCTION TO PROBABILITY AND STATISTICS I
1702.361 - INTRODUCTION TO PROBABILITY AND STATISTICS II
1701.332 - INTRODUCTION TO NUMERICAL ANALYSIS
1701.353 - DIFFERENTIAL EQUATIONS
1703.400 - APPLICATIONS OF MATHEMATICS

or

3. Theoretical Mathematics option: two of the following:

1701.330 - INTRODUCTION TO REAL ANALYSIS I
1701.331 - INTRODUCTION TO REAL ANALYSIS II
1701.340 - MODERN ALGEBRA I
1701.341 - MODERN ALGEBRA II
1701.350 - GEOMETRY I
1701.351 - GEOMETRY II
1701.352 - THEORY OF NUMBERS

IV. ADMINISTRATION

The Chairperson of the Department of Mathematics and Computer Science will assume the responsibility for the administration and supervision of this Minor.

V. RESULTS OF CONSULTATION

Parties Consulted

Business - Leo Beebe
Economics - Habib Jan
Physics - Larry Delaney
Computer Science - Jack Cimerich

Agreement II

The Department will redesign its present concentration in mathematics into a minor and will submit a proposal to the All-College Curriculum Committee during the 1985-86 academic year.

1. Develop or offer a foundations course at the level of Calculus I to introduce concepts and techniques of proofs.
2. Consider the requirement of a senior paper in mathematics.

The Department is in general agreement with the need for a foundations course; however, they point out that they had been moving in this direction even before the departmental self-study. Regarding the requirement of a senior paper, the Department has incorporated the senior paper into its new Mathematics Senior and believes that this will be a better way to achieve the intent of the recommendation.

Agreement III

The Department has decided to revise the mathematics program curriculum to include as a requirement the present course, "Discrete Mathematics." This program revision will be submitted to the All-College Curricular Committee during the Spring Semester 1986. "Discrete Mathematics" has been a requirement in the computer science program and based on this experience, the Department believes inclusion of this course as a requirement for the mathematics program will serve the purpose of a foundations course as recommended by the consultant.

State of New Jersey
GLASSBORO STATE COLLEGE
GLASSBORO, NEW JERSEY 08026

Approved: _____

May 2, 1986

Dr. Ronald J. Czochor
Department of Mathematics/Computer Science
Robinson Building
Glassboro State College
Glassboro, New Jersey 08026

Dear Ron:

Thank you for consulting with me about your proposed Undergraduate
Minor in Mathematics.

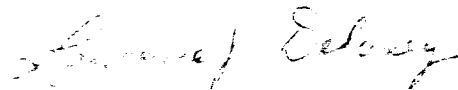
The proposed course choices in the applied and theoretical
areas are well selected to meet the needs of non-mathematics majors
and will provide a good strength and foundation.

My only suggestion would be that the courses listed in the applied
area be changed to include a course in computer science, which
is a very important area. However, if a course in that area
could help, it would be included in a separate section.

It seems to me that the mathematics minor which you propose would be
well served by having students who are interested in areas which have
mathematical-related needs and a supervisor is needed.

Thank you for your very kind and good support.

Sincerely,



Lawrence J. Delaney
Professor

Copy: Dr. Fred Mehat, Chairman
Mathematics/Computer
Science Department

Condolee's Report

to the

Faculty, Administration, and Students

of

Glasboro State College
Glasboro, New Jersey 08035

converting

The Bachelor of Arts Degree Program in Mathematics
Glasboro State College

by

Marjorie Knox

Ph.D.

Department of Mathematics and Computer Science
Glasboro State University
P.O. Box 26160
Glasboro, NJ 08035

of proofs.

New Degree Model

There is also a need for a culminating activity to give students an opportunity to experience Mathematics.

2.3.2 -- Consider the requirement of a senior paper in Mathematics.

Use of the term "preparation" implied of "minor" may not convey the intended information to one reading a Glassboro State college transcript.

Math Minor

2.3.4 -- Consider using the more standard term "minor" or "prepare" in the transcript.

2.3.5 -- Consider

The standards for the curriculum are appropriate and rigorous. The curriculum is logical and coherent. However, so is taking the first part of four letters.

Consider students do not experience a smooth transition into their advanced mathematics courses where the understanding and construction of proofs are demanded.

New Degree Model

2.3.1 -- Develop and offer 2 formulations courses at the level of Calculus I to introduce the concepts and techniques