

CURRICULUM PROPOSAL FORM 1999-2000

NON-GENERAL EDUCATION PROCESS A

*DEADLINES: Deadline dates for 1999/2000 submissions: Regular proposals: October 22, 1999 to be implemented in Fall 2000; Short-Term proposals: December 10, 1999 to be implemented in Fall, 2000; Regular proposals February 18, 2000 to be implemented in Spring, 2001; March 24, 2000 for short-term courses to be implemented in Spring 2001.

1701.310

PROPOSAL TITLE: COLLEGE GEOMETRY

SPONSOR(S): DRS. ERIC MILOU & JANET CALDWELL

DEPARTMENT: MATHEMATICS

COLLEGE:
 IF LAS CHECK ONE: ___ History/Humanities Math/Sciences ___ Social/Behavioral Sciences

Check one: ___ Undergraduate ___ Graduate

IS THE ATTACHED NON-GEN-ED PROPOSAL BEST DESCRIBED BY THE ITEM(S) CHECKED.

New non-gen-ed course

___ Short-term non-gen-ed course

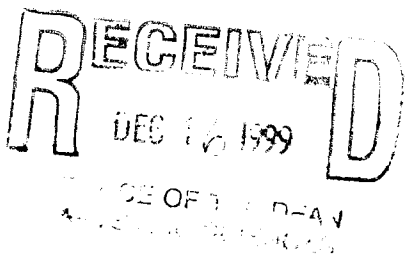
___ Minor curricular changes (fewer than three) to:

 ___ existing non-gen-ed course

 ___ non-gen-ed degree requirements

 ___ major

 ___ minor, specialization, concentration, track, certificate program



DEPARTMENT
 (Signature indicates approval)

J. Shourty, Ph.D. / 12/15/99

Dept. Curriculum Chair / Date

Arnold J. Galen / 12/15/99

Dept. Chairperson / Date

ACADEMIC DEAN

Approved Not Approved ___ Comments: _____

Dean's Signature/Date [Signature] / 12-17-99

COLLEGE CURRICULUM COMMITTEE

Date of open hearing 12-7-99

Approved X

Not Approved _____

Comments:

Signature of College Chair/Date: [Signature]

UNIVERSITY CURRICULUM COMMITTEE

Date Received/Processed 3/3/00

Comments:

Curriculum Chair Signature [Signature]

Date announced at Senate 3/4/00

EXECUTIVE VICE PRESIDENT/PROVOST

Approved ✓

Not Approved _____

If no, reasons are as follows:

Student Credit Hours _____ Faculty Load Hours _____ Equalized Credit Hours _____

Official Copy & Approval Sheet Filed (Date): _____

Executive VP/Provost Signature/Date [Signature] 2/4/00

REGISTRAR

Date Approved Course Description Received _____

Hegis Taxonomy & Course Number Assigned 1701-310

Registrar Signature/Date Robert A. Kubat 2/11/00

NOTIFICATION FORWARD

Senate Curriculum Committee Chairperson

Academic Dean(s)

Department Chairpersons

Registrar

Sponsor(s)

Rowan University
Department of Mathematics

New Course Proposal

1. Details:

- A. Course Title: College Geometry *1701.370*
- B. Sponsor: Drs. Eric Milou & Janet Caldwell, Mathematics Department
- C. Credit Hours: 4
- D. Course Level: Undergraduate, 300 level
- E. Prerequisites: Calculus II (1701.131), Intro. to Symbolic Logic (1509.130), Linear Algebra, 1701.210, or permission of instructor
- F. Suggested Time, Implementation: One section of the course to be offered once a semester or as needed beginning Fall 2000.
- G. Curricular Effect: Elective course for all mathematics majors. Recommended elective for secondary education mathematics majors. Replaces Geometry I (1701.350) and Geometry II (1701.351) (which will be deleted) for secondary mathematics majors.
- H. Adequacy: Present staff is adequate.
- I. Resources: Faculty, computer equipment, and mathematics department calculator resources are adequate.

2. Rationale:

- (1) With the completion of the New Jersey Mathematics Curriculum Frameworks (1995), the Geometry requirements for prospective secondary students have been revised. This curriculum change will enable us to align our curriculum with the State's requirements.
- (2) Currently the department offers Geometry I (3 sh) and Geometry II (3 sh) as elective courses. Some of the content of Geometry I is a review of high school geometry and can be eliminated and the current syllabus of Geometry II leaves flexibility for the instructor to pursue a variety of topics. Some aspects of Geometry II (Non-Euclidean

Geometry & Higher Dimensional Geometry) will be incorporated into College Geometry.

- (3) Currently, pre-service secondary education majors are required to take Geometry I and II. These majors are approximately 75% of the Geometry I students and nearly 100% of the Geometry II students. Thus, since the department requires only 9 credits of free electives, these students have only 3 credits available to choose a truly free elective in their program. This curricular change will allow these students to have more freedom in their elective choices.

3. Essence of the Course:

- A. This geometry course will use both synthetic and analytic approaches to study advanced concepts in Euclidean geometry, to introduce Non-Euclidean geometry, to explore the basics of Transformational geometry, and Higher Dimensional geometry. Computer use will be emphasized throughout the course. This course is designed primarily for prospective secondary school mathematics teachers. Thus its purpose therefore is to further the student understanding of axiomatic systems, to familiarize her/him with the differences and similarities between Euclidean and Non-Euclidean geometries, to trace the historical development of geometry, and to introduce selected advanced topics in the study of geometry.

B. Course Outline:

- I. Foundations of Geometry (Points, Lines, Segments, & Angles) via an axiomatic approach.
 - A. Historical Overview
 - B. An introduction to Axioms and Proof
 - C. Incidence Axioms
 - D. Betweenness, Segments, Rays, & Angles
 - E. Plane Separation Postulate, Angle Measure

- II. Euclidean Geometry of Triangles, Quadrilaterals, and Circles via an axiomatic approach.
 - A. Congruence Relations
 - B. Similarity Relations
 - C. Quadrilaterals (including Ptolemy & Brahmagupta)
 - D. Circle Theorems

- III. Alternative Concepts for Parallelism: Non-Euclidean Geometries
 - A. Historical Background of Non-Euclidean Geometries
 - B. Hyperbolic Geometry (in the Beltrami-Poincare Half-Plane Model)
 - C. Other Models for Hyperbolic Geometry
 - D. Spherical Geometry (Lorentz Spheres)

- IV. Transformational Geometry
 - A. Plane Transformations
 - B. Reflections, Translations, Rotations, Dilations & other transformations
 - C. Tessellations
 - D. Coordinate Characterizations

- V. Higher Dimensional Geometry
 - A. Orthogonality & Parallelism in Space
 - B. Prisms, Pyramids, Cones, Cylinders, & Spheres
 - C. Volume and Surface Area in E^3
 - D. Coordinates, Vectors, & Isometries in E^3

- VI. Fractal Geometry

- VII. Convexity (Optional)

- VIII. Projective Geometry (Optional)

- C. Evaluation & Grading: Students will be evaluated by the traditional methods of written homework and exams. Moreover, students will have written papers which examine research findings and perform hands-on activities with the various technologies.
- D. Course evaluation: This course will be evaluated through the customary student evaluations as well as a regular departmental review.

4. Results of Consultation

Consultation with secondary education (Dr. J. Gallagher, Chair of Secondary Education) was held. See letter of support.

5. No additional information

Catalog Description: College Geometry (4 s.h.)


(Prerequisites: Calculus II, 1701.130, Linear Algebra, 1701.210, and Intro to Symbolic Logic, 1509.130) This geometry course will use both synthetic and analytic approaches to study advanced concepts in Euclidean geometry, to introduce Non-Euclidean geometry, to explore the basics of Transformational geometry and Higher Dimensional geometry, and to trace the historical development of geometry. Computer use will be emphasized throughout the course.



Mathematics Department

MEMORANDUM

To: Martin Itzkowitz, College Writing

From: Eric Milou, Mathematics (x3876) 

Date: December 16, 1999

Re: College Geometry Course Proposal

As per your conversation with Ron Czocho, attached is the College Geometry course proposal written as a NEW course. The proper signatures (Dept Curriculum Chair, Dept Chair, Dean, and College Curriculum Cmte Chair) have been acquired. Please note that the letter of support from Secondary Education is attached to the original minor change proposal. Thank you for allowing us to make this change and for acting on this proposal.



Department of Secondary Education/Foundations of Education

September 21, 1999

MEMORANDUM

To: Dr. Eric Milou and Dr. Janet Caldwell, Mathematics Department

From: John V. Gallagher, Chairperson

Re: New Mathematics Course Proposals

Thank you for the opportunity to review the three course proposals of the Mathematics Department. Please consider the following as you continue through the process of approval and implementation.

1. **Geometry I to College Geometry - 4 semester hours:** The opportunity for students to study an expanded set of topics in geometry will certainly enhance the background of future mathematics teachers, the viewpoint of this letter of consultation. However, it could also expand the understanding of the mathematics major not bound for a career in teaching. Therefore, I recommend that you remove any statements concerning the preparation of mathematics teachers from your proposal. I highlighted your proposal, attached, where I recommend removal of such text. I also ask that you review the standards of the NCTM and the New Jersey Core Curriculum Standards in Mathematics to be sure that the student in this course will receive adequate preparation in appropriate areas of Geometry for future teaching. I ask that you review your reduction of Euclidean topics to be sure that the student receives sufficient coverage from a college level of study. The inclusion of study of historical aspects of subject matter and the use of technology to enhance and support its study strengthens the proposal. We request that you consider the above and further consult with us only if you make other substantial changes. We certainly support the directions of this initiative. A course in geometry is required for mathematics teacher certification in New Jersey and in many other states as well as within the standards of the National Council for the Accreditation of Teacher Education (NCATE).
2. **Course Deletion: Geometry II.** With the implementation of the new course College Geometry, as stated above, we concur with the deletion of this course.