1 copy

No SCC#

4-5-34

1975

FACULTY SENATE

CURRICULUM COMMITTEE

Course Approval Form

Department Mathematics

Title Experiencing Mathematics

Sponsor(s) David Travis No. of Credits 3

Approved by the department Graduate ( )

Not recommended by the department Undergraduate (✓)

Information copies forwarded: Academic Dean; Chairman; Curriculum Committee

Signature: Department Chairman

ACADEMIC DEAN

Consultation on proposal has been held

Comments:

Signature: Academic Dean 2/25/75

CURRICULUM COMMITTEE

Proposal received 3/10

Open Hearing held 3/12

Returned to the department for the following reason(s): need cat. class. 3/14

Approved by the Curriculum Committee done 3/15

Presented to Executive Committee of the Faculty Senate as information 3/15

Notifications forwarded: Academic Dean; Department Chairman

Signature: Chairman, Curriculum Committee

ACADEMIC DEAN

I have reviewed the final documents as approved and concur with same. Budget, faculty and library resources are adequate for immediate implementation.

I have reviewed the final documents as approved and concur with same. Budget, faculty and/or library allocations for the current academic year are inadequate for immediate implementation or implementation in the next fiscal year. The earliest that the proposal might be implemented would be

_____

HEGIS Taxonomy Number: _____

_____
Signature: Academic Dean

Copies forwarded: Chairman, Curriculum Committee; Department Chairman; Provost; Registrar

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REGISTRAR

Approved course description received

_____
Signature: Registrar

PROVOST

Official copy and approval sheet filed

_____
Signature: Provost (or designee)

Note: 1) Course proposal format is attached

2) A copy of this approval form should accompany each proposal

3) A copy of a proposed catalogue description of the course must accompany the proposal as a separate page.

The proposed course, Experiencing Mathematics, sponsored by Professor David Travis has been approved by the departmental curriculum committee.

The department has tenatively scheduled one section of this course for the fall semester 1975.

As a general education course, this will better serve those students that presently take Introduction to Math. I as a terminal course.

I consider this a most important addition to our offerings and strongly urge approval by the college curriculum committee.

John Sooy
Chairman, Department of Mathematics

Course Proposal

I. Title of the Course: Experiencing Mathematics

Department: Mathematics

Sponsor: David L. Travis

II. Essence

1. Undergraduate
2. 3 semester hours credit
3. Course would be open to freshmen through seniors
4. Prerequisites: None - normal high school background
5. Curricular pattern: General education choice - particularly for students who will not normally take any other college mathematics.
6. Time and scale of implementation: Initially one section scheduled fall 1975.

III. 1. Adequacy of present staff and resources: Personnel and physical resources completely adequate.

2. Library facilities: Savitz library has an excellent selection of books for this type of course. Many faculty members have personal texts that are useful.

3. Space needs: Ordinary classrooms.

4. Uniqueness of the course: Currently the course taken by most students for the purpose of fulfilling a general education requirement is the Introduction to Mathematics I. This course was designed to prepare students for the required liberal arts mathematics competency, and consists of basic mathematics manipulative skills. It is a "sequential" course - that is, each topic in the course is built on the ones that went before and the entire course is preparation for another course.

The current proposal is intended to be a non-sequential, non-skills course that is not specific preparation for another course. There would be minimal overlap with existing courses. If a student doesn't understand a topic in a "sequential" course he is essentially lost from then on. One of the unique aspects of the proposed course is that this "hopelessly lost" feeling should be minimized since the topics would be varied and self-contained.

Glassboro has never had a mathematics course that was really a pure general education course. For that matter, very few colleges have one such. The proposer here has surveyed over a hundred catalogs of other colleges and universities. Only 6 or 7 have a roughly comparable course.

5. The objective of the course is the understanding and appreciation of what mathematics is and what mathematicians do, as opposed to learning how to do "skills" mathematics. There would be few if any "proofs" and little or no "rigor". The course should be the mathematical equivalent of the Experiencing Art or Experiencing Music courses. In all topics there would be a discussion of the history and derivation of the material.

Some of the specific topics that would be included in the course:

The concepts of Inductive reasoning and Deductive reasoning, their nature and place in mathematics.
Some Historical perspectives - where did it all come from.
Algorithms - why do we use the processes we do to perform arithmetic and some uncommon algorithms.
Number Theory - such as casting out 9's or 11's, divisibility, some of the tricks that can be performed. Numerology and superstitions. Unsolved problems
Some non-rigorous geometry - the Pythagorean theorem, the ancient Greeks measurement of the Earth, some pragmatic aspects such as the rigidity of a triangle and three points determining a plane.
Some Combinatorial Topology including Network traversibility, the minimum distance, and the minimum surface. Morbus strip and Klein bottles. The "four color" problem in maps. Hexaflexagons and tetraflexagons.
PERT charts - (Program Evaluation and Review Technique), constrained edges and slack time. Minimum time for a job made up of an intertwined sequence of tasks.
Linear Programing - use of the graphic techniques to analyze a two variable problem for maximum profit.
Elementary Cartography - theories of map projections.
Number systems - the various types, through irrational numbers. The number π , its history and computation. The "golden ratio" phi (or Tau) its history and application (the golden section, etc.)
Percentage fallacies, "proof" that 2 = 1, mnemonic devices. What are known as "Mathematical Misteaks" (i.e. 26/65 = 2$\not6$/$\not6$5 = 2/5) twisted logic.
Magic squares - their nature, history and construction
Computers - their nature and operations. Elementary programming language (BASIC). Calculators and their use.
The nature of infinity - the paradoxes produced (Achilles and the Tortoise for example)
Probability - the "laws" of probability, Permutations and combinations (i.e. - why we have 3 letters and 3 numbers on license plates). Applications to common probabilistic situations (i.e. lotteries, card games, dice games)
Relations - their nature and properties (reflexive, symmetric, transitive), the "preference paradox".
Statistics - What are statistics and where do they come from? The uses and abuses of statistics. (ref. How to Lie with Statistics by Huff)

IV. Rationale:

As long as the department and college are committed to the basic principle that a significant portion (45 - 48 hours) of a student's college work should be in the area of general education, there should certainly be both merit and value in a non-technical course designed solely for this purpose.

A survey was recently taken in the current Introduction Mathematics I classes. It was discovered that approximately 160 or 50% of the students did not plan to take any more mathematics. It seems reasonable to infer that, most of these students are taking the course for general education purposes and that it is the only mathematics course they will

take in college.

It seems to me we are failing these students by forcing them to take a course designed to prepare them for another course they will never take. The current proposal is designed to remedy this failure.

V. Consultations:

(on separate sheets)

VI. Additional information and comments:

There should be no increase in the total number of mathematics courses scheduled. Each section of this new course would simply replace a section currently scheduled as Introduction to Mathematics I.

Suggested Catalog Description

Experiencing Mathematics

A general education course designed to demonstrate what mathematics is and what mathematicians do. The course deals with Mathematics appreciation and not with developing mathematical skills; it is not intended as preparation for any other course. For many taking it, this would be their only college mathematics course.

Some topics would include: Probability; uses and abuses of statistics; the nature of infinity; applications and misapplications of mathematics; some historical perspectives; and topics from "recreational mathematics".

Note: The course does not satisfy the competency requirement for liberal arts majors.