



# 18

INDIANA UNIVERSITY OF PENNSYLVANIA • INDIANA, PENNSYLVANIA 15705

Department of Mathematics • 233 Stright Hall • (412) 357-2608

Date: March 4, 1987

Subject: New Program Proposal

To: Senate Curriculum Committee B-2

From: M. E. Hartman  
Mathematics Department

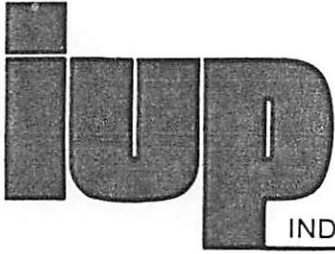
A handwritten signature in cursive script, appearing to read 'M. E. Hartman', written over the typed name and department.

I hope that this brief statement concerning our proposed revision of the Mathematics Education Program will be a time saver for you.

I have provided a copy of the current program as it is listed in pp. 203-204 of the 1986-87 catalog. If you compare that sheet with the new program included in the main body of the document, you will see that the professional education sequence remains the same. The new program provides calculus and statistics options for students who wish to teach Junior High/Middle School and less talented students in the senior high as well as those students who do not at this time wish to enter graduate programs in mathematics or at least programs requiring a strong calculus base.

We feel that the "two-tracked" program we are proposing will produce very capable secondary mathematics teachers in the numbers required to meet the existing demand and which will prevent the existing shortage of mathematics teachers from reaching crises proportions.

MEH/emw



INDIANA UNIVERSITY OF PENNSYLVANIA • INDIANA, PENNSYLVANIA 15705

Department of Mathematics • 233 Stright Hall • (412) 357-2608

Present Program

(Taken from IUP catalog 1986-87, pp. 203-204)

BACHELOR OF SCIENCE IN EDUCATION IN MATHEMATICS EDUCATION

GENERAL EDUCATION: As outlined in General Education section with the following specifications:

Mathematics: (included in major)

Social Science: HI 104, PC 101

Science/Math Electives: CO 110

MAJOR:

31

Required courses:

MA 127	Calculus I	4 sh
MA 128	Calculus II	4 sh
MA 171	Introduction to Linear Algebra	3 sh
MA 227	Calculus III	4 sh
MA 271	Introduction to Algebraic Structures	3 sh
MA 355*	Foundations of Geometry I	3 sh
MA 363	Mathematical Statistics I	3 sh

Controlled electives:

One course from list: 1 sh  
 MA 452, 453, 454

One course from list: 3 sh  
 MA 353, 371, 421, 476

One additional MA majors course 3 sh

OTHER REQUIREMENTS:

30

Professional Education sequence		
CM 301	Instructional Media	3 sh
ED 242	Pre-student Teaching I	1 sh
ED 342	Pre-student Teaching II	1 sh
ED 441	Student Teaching	12 sh
ED 442	School Law	1 sh
ED 456	Teaching Math. in the Secondary School	3 sh
EP 302	Educational Psychology	3 sh
EP 377	Educational Tests and Measurements	3 sh
FE 302	History and Philosophy of Education	3 sh

FREE ELECTIVES:

14

TOTAL DEGREE REQUIREMENTS: 124

\*(error in catalog)

INDIANA UNIVERSITY OF PENNSYLVANIA  
SENATE CURRICULUM COMMITTEE B-2

REVISED PROGRAM PROPOSAL

Program: Mathematics Education

Department: Mathematics

Person to Contact for Further Information: Dr. Marlin E. Hartman

Desired Effective Semester for Change: Fall 1987

Approvals:

Department Committee Chairperson

*Marlin E. Hartman*

Department Chairperson

*John Broughton*

*Charles W. Ryan*

School Committee Chairperson

*Charles W. Ryan*

School Dean

*John Broughton*

PROPOSED REVISION  
of Mathematics Education Program

A minimum of 36 hours in mathematics courses (MA prefixes) is required.

MA 117	Principles of Mathematics <sup>1</sup>	3 hr
MA 127/128/227	Calculus I, II, III	12 hr of 8 hr
	or	
MA 123/124	Calculus I, II for Physics & Chemistry	
MA 363/364	Mathematical Statistics I, II	6 hr or 4 hr
	or MA 216 Prob & Stat for Natural Sciences	
MA 171	Intro to Linear Algebra	3 hr
MA 271	Algebraic Structures	3 hr
MA 353	Theory of Numbers	3 hr
MA 355	Foundations of Geometry I	3 hr
MA 350	History of Mathematics <sup>1</sup>	2 hr
MA 457	Computers and Calculators in Secondary School Mathematics Instruction <sup>1,2</sup>	3 hr
MA 452	Seminar in Teaching Algebra	1 hr
	or	
MA 453	Seminar in Teaching Geometry	
	or	
MA 454	Seminar in Teaching General Mathematics	33-39 hr

If neither MA 127/128/227 nor MA 363/364 sequences are selected, then at least one course from the following:

MA 371	Linear Algebra	3 hr
MA 422	Advanced Calculus I	3 hr
MA 476	Abstract Algebra I	3 hr
MA 445	Programming Models in Ops Research	3 hr

The following professional education courses are also required:

EP 302	Educational Psychology	3 hr
EP 377	Educational Tests and Measurements	3 hr
FE 302	History and Philosophy of Education	3 hr
CM 301	Instructional Media	3 hr
ED 242	Pre-Student Teaching Experience I	1 hr
ED 342	Pre-Student Teaching Experience II	1 hr
ED 442	School Law	1 hr
ED 456	Teaching Mathematics in the Secondary Schools	3 hr
ED 441	Student Teaching	12 hr

<sup>1</sup> Proposed new course

<sup>2</sup> Prerequisite: CO 205 Programming Languages for Secondary Education



In order to update our mathematics education program and to address some of the concerns expressed by our external evaluators during our recent departmental evaluation, the following proposed revised program for the certification of teachers in secondary school mathematics has been approved by the Mathematics Department. This program is strongly influenced by published reports of two nationally recognized professional societies:

1. "Recommendations on the Mathematical Preparation of Teachers", 1983 report of the Committee on the Undergraduate Program of the Mathematical Association of America.
2. "Guidelines for the Preparation of Teachers of Mathematics", 1981 report of the Commission on the Education of Teachers of Mathematics of The National Council of Teachers of Mathematics.

CATALOG DESCRIPTIONS  
of Proposed New Courses

MA 117 Principles of Mathematics

3 hours credit

This course is an introduction to the nature of mathematics, designed specifically as a first course for mathematics education majors. It provides an opportunity for the mathematics education major to experience several facets of mathematics including: deduction, induction, problem solving, discrete mathematics, and theory of equations. Three lecture hours per week.

MA 350 History of Mathematics

2 hours credit

The history of mathematics is concerned with the origins, philosophy, and development of the mathematical sciences. The prerequisite is completion of a calculus sequence or permission of the instructor. Two lecture hours per week.

MA 457 Computers and Calculators  
in Secondary School Mathematics Instruction

3 hours credit

Students will explore how computers and calculators can be used as tools to enhance the instruction in secondary school mathematics. Prerequisites: CO 200 and CO 110. Three lecture hours per week.