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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

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

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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: MA 452, 453, 454 | | 1 sh | |
| One course from list: MA 353, 371, 421, 476 | | 3 sh | |
| 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 Measurments | 3 sh | |
| FE 302 | History and Philosphy 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 John Broughton

School Committee Chairperson

Charles W. Ryan

School Dean

# PROPOSED REVISION
## of Mathematics Education Program

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

| | | |
|---|---|---|
| MA 117 | Principles of Mathematics[1] | 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[1] | 2 hr |
| MA 457 | Computers and Calculators in Secondary School Mathematics Instruction[1,2] | 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 |

[1] Proposed new course

[2] 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 nationaly 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.