Committee on the Undergraduate Program in Mathematics (CUPM)

Charged with making recommendations to guide mathematics departments in designing curricula for their undergraduate students.

The Mathematical Association of America
Undergraduate Programs and Courses in the Mathematical Sciences:

**CUPM Curriculum Guide 2004**

This is the first CUPM report to address the entire undergraduate mathematics curriculum, for all students.

It is the result of four years of work including extensive consultation with hundreds of mathematicians as well as faculty from biology, chemistry, economics, engineering and other partner disciplines.

Supported by grants from NSF and the Calculus Consortium for Higher Education

The Mathematical Association of America
Historical Background to the *Guide*

*CUPM* established 1953 (as *CUP*). Curriculum guidelines published 1965, 1972, 1981 and 1991 focus on the major

Work on *CUPM Curriculum Guide 2004* began in 1999
CUPM Working Assumptions

• One curriculum is not appropriate for all majors
• Must serve a wide variety of mathematics-intensive majors and be responsive to the needs of other disciplines
• Must serve the needs of a very large population often enrolled in, but not optimally served by, college algebra courses.

The Mathematical Association of America
Preparing for the Guide

– Focus groups at Joint Math Meetings 2000, 2001 & Mathfest 2002—over 500 participants
– Panel discussions at meetings
– Invited papers, September 2000
– Reports from AMS, AMATYC, ASA, NCTM
– CRAFTY Curriculum Foundations Project

The Mathematical Association of America

- Attitudes of mind and analytical skills, reasoning
- Interplay of applications, problem solving and theory
- Broad, flexible major for diverse student goals
- Take advantage of technology
- Recruit and nurture majors; have good advising
- Include data analysis and discrete mathematics in major

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New themes, CUPM 2004

• Look outward and include non-majors
• Know students, create appropriate goals, evaluate courses and programs; faculty support
• Specify student expectations vs. lists of topics
• Emphasize mathematical thinking and communication in all courses, incremental approach
• Promote interdisciplinary cooperation, joint majors, introductory statistics and discrete mathematics courses
• Alternative routes to the major

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Six General Recommendations

1. Understand the student population and evaluate courses and programs.

2. Develop mathematical thinking and communication skills.

3. Communicate the breadth and interconnections of the mathematical sciences.

The Mathematical Association of America
Six General Recommendations

4. Promote interdisciplinary cooperation.

5. Use computer technology to support problem solving and to promote understanding.

6. Provide faculty support for curricular and instructional improvement.

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Supplementary Recommendations for Specific Student Audiences

A. General education or introductory courses,

B. Majors in partner disciplines, elementary & middle school teachers,

C. Majors in mathematical sciences,

D. Secondary school teachers, majors preparing for non-academic workforce, majors preparing for graduate school.

The Mathematical Association of America
Illustrative Resources

A web-based supplement to CUPM Guide

Illustrative Resources describes courses, programs, curricular materials, articles, etc. that illustrate ways the recommendations can be implemented at varied institutions.

The Guide and its companion Illustrative Resources are available at www.maa.org/cupm

The Mathematical Association of America