New Course Request

Check Appropriate Boxes: Undergraduate credit [X] Graduate credit [ ] Professional credit [ ]

1. School/Division: Liberal Arts and Sciences
2. Academic Subject Code: MATH
3. Course Number: M108 (must be cleared with University Enrollment Services)
4. Instructor: Various Faculty
5. Course Title: Quantitative Reasoning

Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)

First time this course is to be offered (Semester/Year): Spring 2003

Credit Hours: Fixed at 3 or Variable from ________ to ________

Is this course to be graded S-F (only)? Yes [ ] No [X]

Is variable title approval being requested? Yes [ ] No [X]

Course description (not to exceed 50 words) for Bulletin publication: P: M014 or Level III on the Mathematics Placement Examination. Number sense, operations, mathematical relationships, functions, data interpretation, geometry, measurement, reasoning. Emphasis on building conceptual understanding and developing problem solving skills. Does not satisfy liberal arts and sciences general education requirements.

Lecture Contact Hours: Fixed at ________ or Variable from ________ to ________

Non-Lecture Contact Hours: Fixed at ________ or Variable from ________ to ________

Estimated enrollment: 30 of which 0 percent are expected to be graduate students.

Frequency of scheduling: Once a year

Will this course be required for majors? Yes [ ] No [X]

Justification for new course: Address needs of prospective secondary teachers and prepare them for

Are the necessary reading materials currently available in the appropriate library? Yes [ ] PPST.

Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

Department Chairman/Division Director

Date: 9-10-02

Dean of Graduate School (when required): Chair, Curriculum Committee

Date: 2/20/03

Approved by:

Date: 11/22/02

Dean

Chancellor/Vice-President

Date

University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White.
Quantitative Reasoning
M108
(3 credit hours)
Paulette Zizzo
Proposed August 21, 2002

Intended Audience: Students preparing to become secondary teachers who are
majoring in English, Social Studies, or Foreign Language.

Rationale: Prospective secondary teachers of English, Social Studies, or Foreign
Language are required to pass the Pre-Professional Skills Test (PPST) in mathematics. A
significant number of these students- about 30% - are not able to achieve a passing grade.
No currently offered mathematics course at IUSB, or on any of the IU campuses,
adequately addresses the content required for this examination. To help IUSB students
attain the content knowledge necessary to pass the PPST is a reasonable request endorsed
by the Mathematics Department as well as the School of Education.

Course Description: M108, Quantitative Reasoning, is a course designed to help
students attain conceptual understanding of key concepts in mathematics, as well as
develop problem solving skills and mathematical reasoning abilities. Topics covered will
include number sense and operation sense, mathematical relationships and functions, data
interpretation, geometry and measurement, and quantitative reasoning.
This course is only open to prospective secondary teachers majoring in English, Social
Studies or Foreign Language. Prerequisite: M014 or level III on the math placement
test. This course does not satisfy the Languages of Quantity requirement.

Course Content:

- **Number and Operation Sense**
  - Recognize the position of numbers in relation to each other
  - Recognize equivalent forms of a number, including square roots and powers of a
    number
  - Demonstrate an understanding of the characteristics of counting numbers,
    including composites, primes, even, odd, factors and multiples

- **Operation Sense**
  - Perform computations in problem-solving situations and adjust the result of
    computations as required by the problem
  - Demonstrate an understanding of fundamental operations or algorithms
  - Follow a given procedure
  - Select a sequence of operations to obtain the result of a computation
  - Recognize various ways to find answers to problems
  - Solve problems using estimation
- use a simple calculator as a tool in problem-solving

- **Mathematical Relationships**
  - interpret and apply ratio, proportion and percent
  - interpret or determine a simple probability
  - simplify expressions containing variables
  - solve simple equations and inequalities
  - formulate and recognize equations, expressions, or inequalities that represent situations given in words

- **Data Interpretation**
  - read data presented in various formats and make basic observations
  - recognize relationships in data, make comparisons and observe trends
  - summarize data and construct or complete tables, charts, and graphs
  - determine or interpret averages (mean, median and mode) and the range of a set of data

- **Geometry and Measurement**
  - recognize patterns and relationships in simple geometric figures
  - determine length, perimeter, area, volume, of two and three-dimensional figures
  - understand and use various systems of measurement, including metric and U.S.
  - make conversions within the same system or convert units from one measurement system to another using a conversion table

- **Reasoning**
  - interpret sentences containing logical connectives, including and, or, if-then
  - interpret sentences containing logical quantifiers, including some, all, none
  - draw conclusions from given statements
  - determine whether a conclusion based on a sequence of statements is true or false
  - identify examples that disprove false conclusions

**Evaluation**: Evaluation will consist of six tests and a final examination.