

New Course Request

Indiana University

South Bend Campus

Check Appropriate Boxes: Undergraduate credit  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)

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

7. Credit Hours: Fixed at 3 or Variable from to

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

9. Is variable title approval being requested? Yes No X

10. 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.

11. Lecture Contact Hours: Fixed at 3 or Variable from to

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

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

14. Frequency of scheduling: Once a year Will this course be required for majors? No

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

16. Are the necessary reading materials currently available in the appropriate library? Yes

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

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

19. 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) Date 2/02/03
Chair, Curriculum Committee

Approved by: Dean Date 11/22/02

Chancellor/Vice-President Date
University Enrollment Services Date

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.

Indiana University South Bend  
Department of Mathematical Sciences

## **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.