New Course Request

Indiana University
South Bend Campus

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

1. School/Division: CLAS
2. Academic Subject Code: MATH
3. Course Number: A100 (must be cleared with University Enrollment Services)
4. Instructor: Yu Song
5. Course Title: Fundamentals of Algebra
   Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)
6. First time this course is to be offered (Semester/Year): Fall 2011
7. Credit Hours: Fixed at [ ] 4 [ ] 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:
    Designed to provide algebraic skills needed for future mathematics courses. Integers, rational and real numbers, exponents, decimals, polynomials, equations, word problems, factoring, roots and radicals, quadratic equations, graphing, linear equations in more than one variable, and inequalities. May not be used to fulfill the Quantitative Reasoning requirement for general education.

11. Lecture Contact Hours: Fixed at [ ] 4 [ ] or Variable from [ ] to [ ]
12. Non-Lecture Contact Hours: Fixed at [ ] 0 [ ] or Variable from [ ] to [ ]
13. Estimated enrollment: 250/semester, of which 0 percent are expected to be graduate students.
14. Frequency of scheduling: every semester
15. Will this course be required for majors? No
16. Justification for new course: See attached
17. Are the necessary reading materials currently available in the appropriate library? Yes
18. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.
19. 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: [Signature]
Department Chairman/Division Director
Date: 3/29/2010

Approved by: [Signature]
Rebecca Tordick
Dean
Date: 5/11/10

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.
15. **Justification for new course:**

This course is designed to satisfy the prerequisites needed for MATH M107, M111, M118, and K-300; and to advance students to Math Placement Level III. The course will be offered in multiple sections in formats of regular lecture, online or laboratory, in which students can choose to match their leaning style. Majority of sections will be offered in Laboratory format, which combines online materials and required 4 hours of face to face meeting time in an active learning laboratory every week. The newly proposed laboratory format is a self-paced model which will better motivate students and provide students more face-to-face meeting time with tutors and instructors.
Syllabus for Math A-100 Fundamentals of Algebra

Instructor: Dr. Yu Song          Email: yusong@iusb.edu          Office: NS-319
Phone: (574)520-4299          Website: http://mypage.iusb.edu/~yusong


Reference: Supplementary course materials prepared by Richard Cook and Sushma Agarwal of Indiana University South Bend Department of mathematical Sciences.

Course Description: Designed to provide algebraic skills needed for future mathematics courses. Integers, rational and real numbers, exponents, decimals, polynomials, equations, word problems, factoring, roots and radicals, quadratic equations, graphing, linear equations in more than one variable, and inequalities. This course will satisfy the prerequisites needed for MATH M107, M111, M118, and K-300; and will advance students to math placement level 3.

Prerequisite: Mathematics Placement Test Level II.

Grading: Your work is evaluated and weighted as shown for the final grade.

| Attendance: | 3% | 30 points |
| Ten Quizzes: | 15% | 150 points, 15 points each (close book, close notes) |
| Ten Homework: | 12% | 120 points, 12 points each (close book, close notes) |
| Two Exams: | 40% | 400 points, 200 points each (close book, close notes) |
| Final: | 30% | 300 points (close book, close notes) |
| TOTAL: | 100% | 1000 points. Grading scale as below |

A: 90% (900-1000),  B: 80% (800 – 900),  C: 70% (700 – 800),  D: 60% (600 – 700.)  F: Below 60%
Pluses and Minuses will be used at the high and low end of each range, for example 72% is C-, 78% is C+.

Statements regarding ADA Disability, Religious Accommodation and Academic Honesty are given at http://www.iusb.edu/~sbmath/pdf/statements.pdf Disabilities: Students with disabilities who qualify for academic accommodations must provide a letter from Disabled Student Services and discuss specific needs with the professor, preferably during the first two weeks of class. Accommodations will be made based on documented disabilities (520-4832, Administration Building 113, www.iusb.edu/~sbdss/services.shtml)

Academic Honesty: It is the responsibility of the student to know of the prohibited actions such as cheating, fabrication, plagiarism, academic, and personal misconduct, and thus, to avoid them.

Tentative Schedules:

| 0 - 1.5 weeks | |
| Part II | 1.3 The number systems & the Real number line  
1.4 Adding, subtracting, multiplying & dividing integers  
1.5 Adding, subtracting, multiplying & dividing rational numbers expressed as fractions & decimals  
1.6 Properties of Real Numbers  
1.7 Exponents and Order of operations  
1.8 Simplifying algebraic expressions  
2.1 Linear equations: The addition & multiplication properties  
2.2 Linear equations: using the properties together  
2.3 Solving linear equations involving fractions & decimals  
2.4 Evaluating formulas and solving formulas for a variable  
2.5 Introduction to Problem solving: direct translation problems  
2.6 Problem solving: direct translation problems involving percent  
2.8 Solving linear inequalities in one variable  |
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<td>3 - 3.5 weeks</td>
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| Part III | 3.1 The Rectangular coordinate system and equations in two variables  
3.2 Graphing equations in two variables  
3.3 Slope  
3.4 Slope-intercept form of line  
3.5 Point slope form of line  
3.6 Parallel and perpendicular lines  
4.1 Solving systems of linear equations by graphing  
4.2 Solving systems of linear equations using substitution  
4.3 Solving systems of linear equations using elimination  
4.4 Solving direct translation, Geometry and uniform motion problems using systems  
4.5 Solving mixture problems using systems of linear equations  |
| 3 - 3.5 weeks |  |
| Part IV | 5.1 Adding and subtracting polynomials  
5.2 Multiplying monomials: the product and power rules  
5.3 Multiplying polynomials  
5.4 Dividing monomials: the quotient rule and integer exponents  
5.6 Applying exponent rules: scientific notation  
6.1 Greatest common factor & factoring by grouping  
6.2 Factoring trinomials of the form $x^2 + bx + c$  
6.3 Factoring trinomials of the form $a x^2 + bx + c$  
6.4 Factoring special products  
6.5 Summary of factoring techniques  
6.6 Solving polynomial equations by factoring  
6.7 Modeling using quadratic equations  |
| 3 - 3.5 weeks |  |
| Part V | 7.1 Simplifying rational expressions  
7.2 Multiplying & dividing rational expressions  
7.3 Adding & subtracting rational expressions with a common denominator  
7.4 Finding the LCD & forming equivalent rational expressions  
7.5 Adding & subtracting rational expressions with unlike denominator  
8.1 Introduction to square roots  
8.2 Simplifying square roots  
8.3 Adding and subtracting square roots  
8.4 Multiplying expressions with square roots  
8.5 Dividing expressions with square roots  
8.6 Solving equations containing square roots  
8.7 Higher Roots and Rational exponents  |
| 4.5 weeks |  |
| Supplement | American & Metric Units of Measurement & Conversions; Parallel & Perpendicular Lines, Perimeters & Areas of Polygons, Triangles, & Circles, Pythagorean, Surface Area, and Volume |