Southern Illinois University  
Department of Curriculum and Instruction  
CI/Math 388: Integrated Math Content and Methods for P-4 Teachers  
CI 388-001 Fall 2014

Instructor Information

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Course Description
This course is designed for early childhood and elementary school teachers, focusing on Pre-K through 4th grade mathematics content and methods. Math content covers the developmental progression of concepts and skills in counting and cardinality, numbers and operations in base-ten system, algebraic thinking, fractional reasoning, measurement and data, and geometry. Methods of math teaching are integrated with the delivery of math content. The course showcases standards-based mathematical practices including problem solving, mathematical modeling, communication and justification, use of tools and technology, assessment and interventions, diverse learner support, supportive math environments, lesson planning, and interdisciplinary connections. Prerequisite: C or Better in CI/Math 220 or equivalent.

Goal and Objectives
The overarching goal of the course is to empower participants with a knowledge base and inquiry skills to seek profound understanding of Pre-K through 4th grade mathematics and its developmental and pedagogical aspects in accordance with State and National Standards and contemporary educational research findings in early childhood and elementary mathematics teaching and learning.
Major Objectives:

1. Understand the big ideas of P-K mathematics in *counting and cardinality, operations and algebraic thinking, numbers and operation in base ten, fractions and their operations, measurement and data, geometry.*
2. Characterize the **developmental progression** of the big ideas of P-K mathematics and their pedagogical implications for meaningful mathematics instruction.
3. Describe high-leverage instructional practices in mathematics that foster mathematical sense-making and problem solving.
4. Elaborate a lesson plan that integrates mathematics content, methods, and data-based assessment and intervention practices (e.g., RTI), in support of the diverse learning needs of P-4 students.

Course Content: P-4 Mathematics Outline

**Counting & Cardinality**
- Understanding subtizing as the basis for counting and number sense
- Know number names and the count sequence
- Count to tell the number of objects
- Compare numbers

**Operations & Algebraic Thinking**
- Understand the relationship between addition and subtraction
- Four operations with whole numbers
- Factors and multiples
- Generate and analyze patterns

**Number & Operations in Base Ten**
- Generalize place value understanding for multi-digit whole numbers
- Use place value understanding and properties of operations to perform multi-digit arithmetic

**Number & Operations: Fractions**
- Understanding of fractions as numbers
- Fraction equivalence and ordering
- Build fractions from unit fractions
- Decimal notation for fractions

**Measurement & Data**
- Angle and measure angles
Solve problems involving measurement and conversion of measurements
Represent and interpret data

**Geometry**
- Reason with shapes and their attributes
- Draw and identify lines and angles
- Classify shapes by properties of their lines and angles.

**Course Content: P-4 Methods Outline**

**Standards for Mathematical Practices**
- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning
- Using High-Leverage Instructional Practices

**Using Materials, Tools & Technology**

**Monitoring Student Learning by Assessment**

**Meeting the Needs of Diverse Learners**

**Building Supportive Math Environments**

**Professionalism, Communication & Collaboration**

**Developmental Progression of Fundamental Math Ideas**

**Curricular Structure of the State Learning Standards for Mathematics**

**Multi-Tier System of Supports (MTSS)(Response to Instruction/Intervention(RtII)**
- Systematic use of assessment data
- Evidence-based decision-making
- Problem solving approach to math teaching & learning
- Multi-Tier System of Supports
  - Core: Universal supports
  - Targeted Group: supplemental support
  - Intensive: Small group or individualized support
Expectations and Evaluations

1. Students are expected to participate actively and professionally in all forms of face-to-face or online discussions, justifications, and presentations: whole-class, small-group, or individual.
2. Students are expected to show positive attitudes and perseverance toward mathematical problem solving and mathematical teaching.
3. Students are expected to complete all course work, including quizzes, reading, lesson planning, and other special assignments in a timely and professional manner.
4. Students are expected to take initiative and personal responsibility in learning, unlearning, and extending the mathematics covered in the course.
5. Students are expected to critique others’ mathematical understanding in a constructive way and invite others to critique their own mathematical understanding.
6. Students are required to take all exams at a time and a location designated by the university.

Grading Scale

1. Professional participation (5%)
2. Quizzes and Tests (30%)
3. Lesson Planning (10%)
4. Special Assignments (25%)
5. Final Exam (30%)

Letter grade system

1. 90 – 100% A
2. 80 – 89% B
3. 70 – 79% C
4. 60 – 69% D
5. 0 – 59% F

INC (incomplete) will only be assigned when the student is passing the class but cannot fulfill the course requirements because of serious circumstances beyond human control. When an INC is given, an agreement should be established between the instructor and the student with respect to future steps toward course completion. It is the student’s responsibility to follow the university’s policies on INC and complete the course requirements as soon as possible to avoid subsequent academic consequences.

Note: The component percentages are subject to the changing needs of students and the instructor’s focus.
Special assignments may include but not limited to 2-5 of the following, depending on the specific needs of the class.

1. Reading in mathematics and mathematics pedagogy
2. Assessment modules
3. In-depth research of a big math idea
4. Technology and tools in mathematics teaching and learning
5. Theories in mathematics teaching and learning
6. Math anxiety and attitudes
7. Microteaching
8. Critique of lessons
9. Field experiences
10. Interviewing children/Task-based interviews
11. Interdisciplinary instructional planning
12. Language and literacy in mathematics
13. Culturally responsive math teaching
14. Review of State Standards
15. Response to Intervention (RtI) in mathematics

Textbooks, References, Technology, and Tools

Recommended Textbooks [One of the following]


References

2. NCTM Journals on early childhood and elementary mathematics
3. Illinois Common Core Standards: [http://www.isbe.net/common_core/default.htm](http://www.isbe.net/common_core/default.htm)

Technology and Tools
1. GeoGebra at [www.geogebra.org](http://www.geogebra.org) (open source) or similar dynamic math learning environment.
2. Concept Mapping (open source): Freemind, Vue, and IHMC CMAP.
3. Developmentally appropriate iPad® (iOs®) and Android® apps for mathematics teaching and learning.
4. A set of ruler, protractor, triangles, compass, scissors, glue sticks, adhesive tapes, and ready-to-use pencils.

**Academic Honor Code**

All students enrolled in the courses are expected to observe the **Student Conduct Code** published in the University Catalog or Student Handbook, understanding their rights and responsibilities as students. All students should (1) uphold the highest standards of academic integrity in the course work, (2) refuse to tolerate academic dishonesty in the course and the university community, (3) seek truth, order, and professionalism in all on-campus and field experiences, and (4) foster a strong sense of social justice and responsibility. For details of the University Student Conduct Code, please refer to [http://srr.siu.edu/student_conduct_code/index.html](http://srr.siu.edu/student_conduct_code/index.html)

**Special Accommodations**

Students with disabilities needing special academic accommodations should register with and provide documentation to the Disability Support Services and inform the instructor in writing of the specific needs and how the instructor can assist you. This should be done within a week of receiving the syllabus. The instructor will treat all information related to special accommodations as strictly confidential unless informed otherwise. For details, please refer to SIUC Disability Support Services at [http://disabilityservices.siu.edu](http://disabilityservices.siu.edu) or contact

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**Emergency Procedures**

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on the BERT website at [www.bert.siu.edu](http://www.bert.siu.edu), Department of Public Safety’s website at [www.dps.siu.edu](http://www.dps.siu.edu) (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.
The Instructor(s) will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

Registration and Final Exam
All students should make sure they know all the university policies and deadlines for dropping/adding classes and other fee/tuition-related stipulations and deadlines. Please contact the SIUC Registrar’s Office for details at http://registrar.siuc.edu/calendars/registration.html.

The final exam is required of all students and must be taken at the time, date, and location designated by the University. Any specific accommodation or deviation is subject to the approval of the Chair of the Department of Curriculum and Instruction and/or Dean of the College of Education and Human Service. For details about the University policies and schedule, please visit http://registrar.siu.edu/calendars/finalexam.html.

Appendix A
SIUC Early Childhood and Elementary Education Disposition Assessment System

Appendix B
SIUC ELED Lesson Plan Format

Appendix C
SIUC Syllabus Attachment 2014 (Electronic copy at http://pvcaa.siue.edu/index1/Syllabus%20Attachment_Fall2014-12.pdf)