Southern Illinois University
Department of Curriculum and Instruction
CI/Math 389-001: Integrated Math Content and Methods for 4-8 Teachers
Spring 2016: Tuesday 12:00pm to 2:30pm

Instructor Information

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Lingguo Bu, PhD</th>
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<tbody>
<tr>
<td>Office:</td>
<td>Wham 323L</td>
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<tr>
<td>Email/Website:</td>
<td><a href="mailto:LGBU@siu.edu">LGBU@siu.edu</a> /www.bumathed.org</td>
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<tr>
<td>Telephone:</td>
<td>(618)453-8400</td>
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<tr>
<td><strong>Office hours:</strong></td>
<td>T: 8:30 am to 11 am; R: 1pm to 4:30 pm</td>
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<td></td>
<td>Flexible appointments (12 hours by email or phone if possible)</td>
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<tr>
<td><strong>Skype ID:</strong></td>
<td>lingguo.bu</td>
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<tr>
<td><strong>Online Course Site:</strong></td>
<td>online.siu.edu</td>
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<tr>
<td><strong>Classroom:</strong></td>
<td>Wham 202 or Wham 210AB for Computer Lab</td>
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**It's what we think we know already that keeps us from learning.**
(C’est ce que nous pensons déjà connaître qui nous empêche souvent d’apprendre. --Claude Bernard).
Course Description
This course is designed for elementary school and middle school teachers, focusing on 4th -8th grade mathematics content and methods. Math content covers the developmental sequence of grade-appropriate mathematical concepts and skills in number systems, operations and algebraic thinking, ratios and proportional relationships, expressions and equations, functions and applications, measurement and data analysis, statistics and probability, 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 intervention, diverse learner support, supportive math environments, lesson planning, and interdisciplinary connections. Prerequisite: C or Better in CI/Math 388 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 4th through 8th grade mathematics and its developmental and pedagogical aspects in accordance with State and National Standards and contemporary educational research findings in elementary and middle school mathematics teaching and learning.

Major Objectives:

1. Understand the big ideas of 4th-8th grade mathematics in numbers systems, operations and algebraic thinking, ratios and proportional relationships, expressions and equations functions and applications, measurement and data analysis, statistics and probability, and geometry.
2. Characterize the developmental progression of the big ideas of 4th-8th grade 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 4th-8th grade mathematics content, methods, and data-based assessment and intervention practices (e.g., RTI), in support of the diverse learning needs of 4th-8th grade students.

Course Content: 4th-8th Grade Mathematics Outline

Number Systems
- Number operations & fractions
- The system of rational numbers

Operations & Algebraic Thinking
Factors & Multiples
Generate and analyze patterns
Write and interpret numerical expressions

Ratios & Proportional Relationships
Understand ratio concepts and use ratio reasoning to solve problems
Analyze proportional relationships & their real-world applications

Expressions & Equations
Use properties of operations to generate equivalent expressions
Linear equations and pairs of simultaneous linear equations
Work with radicals and integer exponents
Connections between proportional relationships, lines, and linear equations
Solve real-life and mathematical problems

Functions & Applications
Define, evaluate, and compare functions
Use functions to model relationships between quantities

Measurement & Data
Convert like measurement units within a given measurement system
Represent and interpret data
Geometric measurement: angles, length/perimeter, area & volume

Statistics & Probability
Statistical variability & Distribution
Draw informal comparative inferences about two populations
Investigate chance processes and develop, use, and evaluate probability models

Geometry
Graph points on the coordinate plane to solve real-world and mathematical problems
Classify two-dimensional figures into categories based on their properties
Draw construct, and describe geometrical figures and describe the relationships between them
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume
Understand congruence and similarity
Understand and apply the Pythagorean Theorem
Problems involving volume of cylinders, cones, and spheres

Course Content: 4th-8th Grade 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 (RtI)
   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

<table>
<thead>
<tr>
<th>Component</th>
<th>Percent</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Attendance</td>
<td></td>
<td>Final grade will drop one letter for every three hours (namely, one meeting for this class) of unexcused absence, starting from 2nd week. <strong>The 4th unexcused absence will result in an F.</strong> An absence is defined as being late for more than 15 minutes or not showing up.</td>
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<tr>
<td>Professional participation</td>
<td>(5%)</td>
<td>Classroom or community participation such as field experiences and service. <strong>Non-instructional phone or computer use</strong> is considered a violation of classroom rules and a disrespect for other fellow students. Any such behavior will be corrected openly in class; upon the third violation, the student will be asked to leave the classroom immediately, upon which an ELED disposition form will be initiated.</td>
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<tr>
<td>Quizzes and Tests</td>
<td>(30%)</td>
<td>Quiz (15%) + Midterm (15%). No late submission will be graded for credit.</td>
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<td>Lesson Planning</td>
<td>(10%)</td>
<td>Draft (5%) by midterm due to course site at online.siu.edu; Final version (5%) due to LiveText at least <strong>two weeks before</strong> the final exam date. In developing a lesson plan, teacher candidates should consult current State standards for K-8 mathematics AND professional standards for mathematics teachers. The <strong>final format should conform to the current ELED lesson plan framework.</strong> The lesson plan must focus on significant math ideas and seek to develop problem solving skills among diverse students using meaningful assessment and instructional support.</td>
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<td>Special Assignments</td>
<td>(15%)</td>
<td>Reading and research. No late submission will be graded for credit.</td>
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<tr>
<td>Final Exam</td>
<td>(40%)</td>
<td>Required. <strong>Failing to take the final exam will result in an automatic F.</strong></td>
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**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:
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
16. Service such as peer tutoring within ELED math classes
17. Invited speaker or visits to selected classroom teachers

Textbooks, References, Technology, and Tools

Recommended Textbooks [One of the following]

References

3. NCTM Journals on elementary and middle school mathematics
4. Illinois Common Core Standards: [http://www.isbe.net/common_core/default.htm](http://www.isbe.net/common_core/default.htm)
7. Lesson Planning Resources: [http://illuminations.nctm.org](http://illuminations.nctm.org)

**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](http://srr.siu.edu/student_conduct_code/index.html) 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
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, Department of Public Safety’s website at 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.siu.edu/calendars/registration.html.

The final exam is scheduled for Tuesday May 10, 2016 from 1:30 pm to 2:30 pm, subject to changes with approval. 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.

Attachments: COEHS Conceptual Framework & Syllabus

Most recent SIUC syllabus attachment could be downloaded from

Teacher Education Program
The Teacher Education Program (TEP) at Southern Illinois University Carbondale is fully accredited by the National Council for the Accreditation of Teacher Education/ Council for the Accreditation of Educator Preparation (NCATE/CAEP) and by the Illinois State Board of Education. Spanning the entire university, the Teacher Education Program is administered through the College of Education and Human Services and includes majors from the College of Education and Human Services, the College of Science, the College of Liberal Arts, and the College of Agricultural Sciences. Teacher education programs approved by the State Educator Preparation and Licensure Board (SEPLB) are offered at the undergraduate level in early childhood education, elementary education, special education, secondary education, and in majors and minors that lead to the special certificate to teach K-12 art, music, physical education, and foreign languages.

Teacher Education Conceptual Framework: Preparing Reflective Educational Leaders

The conceptual framework identified by Southern Illinois University Carbondale’s College of Education and Human Services reflects the professional community’s commitment to preparing reflective educational leaders at both the undergraduate and graduate levels. Reflective educational leaders are able to review, reconstruct, reenact, and critically analyze their own and their students’ performances as a means to formulate explanations with evidence. A reflective educational leader fosters his/her professionalism in practice when he/she values students’ myriad identities, equips students with the literacies required to participate in a democratic society, and engages stakeholders to make this learning accessible, rigorous, and relevant.

Our conceptual framework views the professional development of teachers and other educational personnel to be an evolutionary and maturational process. Our goal is to prepare a competent, reflective educational leader, ready to assume the responsibilities of educating individuals but with full awareness that his or her induction into the profession continues throughout the duration of his or her professional career. We believe that our teacher candidates not only practice reflective thinking but also become practitioners of reflective action. We believe that effective teaching is characterized by interactions with students to present subject matter, followed by informed reflection on these interactions and presentations. Teachers should make decisions among methods and content based on their competence in both subject matter and pedagogy, rather than acting as technicians following a predetermined curriculum. All unit programs are aligned to the Illinois Professional Teaching Standards as well as standards from their respective content areas.

The model below represents the three major tenets of SIU’s Teacher Education Program: Literacies, Identities, and Engagement:
Literacies:

Reflective educational leaders understand the vast array of literacies students need to function in today’s modern society. This includes knowledge of reading, writing, and aural communication within the content area as well as media, scientific and quantitative literacy (Chessin & Moore, 2004; Crowe, Connor, & Petscher, 2009; Cunningham & Stanovich, 2001; Delpit, 1995; Kear, Coffman, McKenna, & Ambrosio, 2000; Leinhardt & Young, 1996; McKenna & Kear, 1990; Moje, 2008; Perry, & Delpit, 1998; Shulman, 1987; Schwartz, 2005; Wilson, 2006; Wineburg, 2001).

Identities:

Reflective educational leaders understand the diverse characteristics and abilities of all students and how these students develop and learn within the context of their social, economic, cultural, linguistic, and academic experiences. Using these experiences they create instructional opportunities to maximize student learning (Brown, 2005; Cramer, 2006; Epstein, 2009; Irvine, 1997; Olsen, 2010; Rose & Meyer, 2002; Vygotsky, 1962/1996; Washburn, Joshi, & Binks-Cantrell, 2011).

Engagement:

Reflective educational leaders are ethical and reflective practitioners who exhibit professional engagement by providing leadership in the learning community and by serving as advocates for students, parents or guardians, and the profession (Amatea, Daniels, Bringman, & Vandiver, 2004; Bemak, & Chung, 2008; Hiebert, Morris, Berk, & Jansen, 2007; Keys, Bemak, Carpenter, & King-Sears, 1998; Lach & Goodwin, 2002; Ladson-Billings, 1995; McCann & Johannessen, 2008; Ratts, DeKruyf, & Chen-Hayes, 2007).
Dispositions

The professional attitudes, values, and beliefs demonstrated through verbal and nonverbal behaviors (dispositions) as educators interact with students, families, colleagues, and communities should support student learning and development. These dispositions are:

The candidate demonstrates professionalism:
- dependability and reliability
- honesty, trustworthiness, ethics
- enthusiasm, love of learning and commitment to the profession

The candidate values human diversity:
- shows respect and sensitivity to the learning needs and abilities of all individuals
- shows respect and sensitivity to the diverse cultures, languages, races, and family compositions of all individuals
- strives for best practices to address diverse learning needs and abilities of all individuals
- strives for best practices to address diverse cultures, languages, races, and family compositions of all individuals
- collaborates with diverse peers, professional colleagues, staff and families

The candidate develops professionally:
- engages in ongoing acquisition of knowledge
- engages in development of research-based practices
- assesses own performance and reflects on needed improvements

References


IMPORTANT DATES
Semester Class Begins: .......................................................... 01/19/2016
Last day to add a class (without instructor permission): .............. 01/24/2016
Last day to withdraw completely and receive a 100% refund: .... 01/31/2016
Last day to drop a course using SalukiNet: ......................... 04/03/2016
Last day to file diploma application (for name to appear in Commencement program): .................................................. 02/12/2016
Final exams: .................................................................... 05/09 - 05/13/2016

Note: For outreach, internet, and short course drop/add dates, visit Registrar’s Academic webpage http://registrar.siu.edu/

SPRING SEMESTER HOLIDAYS
Martin Luther King, Jr.’s Birthday Holiday 01/18/2016
Spring Break 03/12 - 03/20/2016

WITHDRAWAL POLICY – Undergraduate only
Students who officially register for a session may not withdraw merely by the stopping of attendance. An official withdrawal form needs to be initialed by the student and processed by the University. For the proper procedures to follow when dropping courses and when withdrawing from the University, please visit http://registrar.siu.edu/catalog/undergradstatetocat.html

INCOMPLETE POLICY – Undergraduate only
An INC is assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments. An INC must be changed to a completed grade within one semester following the term in which the course was taken, or graduation, whichever occurs first. Should the student fail to complete the course within the time period designated, that is, by no later than the end of the semester following the term in which the course was taken, or graduation, whichever occurs first, the incomplete will be converted to a grade of F and the grade will be computed in the student’s grade point average.

For more information please visit: http://registrar.siu.edu/grades/incomplete.html

REPEAT POLICY
An undergraduate student may, for the purpose of raising a grade, enroll in a course for credit no more than two times (two total enrollments) unless otherwise noted in the course description. For students receiving a letter grade of A, B, C, etc., the course repetition must occur at Southern Illinois University Carbondale. Only the most recent (last) grade will be calculated in the overall GPA and count toward hours earned. See full policy at http://registrar.siu.edu/catalog/undergradstatetocat.html

GRADUATE POLICIES
Graduate policies often vary from Undergraduate policies. To view the applicable policies for graduate students, please visit http://gradschool.siu.edu/about-grad-catalog/index.html

DISABILITY POLICY
Disability Support Services provides the required academic and programmatic support services to students with permanent and temporary disabilities. DSS provides centralized coordination and referral services. To utilize DSS services, students must come to the DSS to open cases. The process involves interviews, reviews of student-supplied documentation, and completion of Disability Accommodation Agreements.

http://disabilityservices.siu.edu/

PLAGIARISM
Student Conduct Code http://srst.siu.edu/student_conduct_code/

MORRIS LIBRARY HOURS
http://www.lib.siu.edu/about

SAFETY AWARENESS FACTS AND EDUCATION
Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here: http://safe.siu.edu

SALUKI CARES
The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in any type of distress—physical, emotional, financial, or personal. By working closely with faculty, staff, students and their families, SIU will continue to display a culture of care and demonstrate to our students and their families that they are an important part of the community. For Information on Saluki Cares: (618) 433-5714, or salukicares@siu.edu, http://salukicares.siu.edu/index.html

EMERGENCY PROCEDURES
Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. We ask that you become familiar with the SIU Emergency Response Plan and Building Emergency Response Team (BERT) programs. Emergency response information is available on posters in buildings on campus, available on BERT’s website at www.bert.siu.edu, Department of Safety’s website at www.dps.siu.edu (disaster drop down) and the Emergency Response Guideline pamphlet. Instructors 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.

INCLUSIVE EXCELLENCE
SIU contains people from all walks of life, from many different cultures and sub-cultures, and representing all strata of society, nationalities, ethnicities, lifestyles, and affiliations. Learning from and working with people who differ is an important part of education as well as an essential preparation for any career. For more information please visit: http://www.inclusivexcelence.siu.edu/

LEARNING AND SUPPORT SERVICES
Help is within reach. Learning support services offers free tutoring on campus and math labs. To find more information please visit the Center for Learning and Support Services website:

Tutoring: http://tutoring.siu.edu/

Math Labs http://math.siu.edu/courses/course-help.php

WRITING CENTER
The Writing Center offers free tutoring services to all SIU students and faculty. To find a Tutor or Schedule an appointment please visit http://write.siu.edu/

AFFIRMATIVE ACTION & EQUAL OPPORTUNITY
Our office’s main focus is to ensure that the university complies with federal and state equity policies and handles reporting and investigating of discrimination cases. For more information visit: http://diversity.siu.edu/

Additional Resources Available:

SALUKINET: https://salukinet.siu.edu/cp/home/displaylogin

ADVICEMENT: http://advisement.siu.edu/

PROVOST & VICE CHANCELLOR: http://pvcaa.siu.edu/

SIU ONLINE: http://online.siu.edu/

http://pvcaa.siu.edu/