## CI/MATH 220 — Math Content & Methods for ES—II

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<th>CI-220 FALL 2014</th>
<th><strong>Sec. 001</strong></th>
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| **Class Time**   | 9:00am—9:50am  
Wham 201 (MR)  
Wham 202 (T) |
| **Office Hours** | MT: 10am-12pm; Th: 11am to 1pm |
| **Office**       | Wham 323L   
[C&I Office Area] |
| **Appointments** | Always welcome, 12 hours in advance by email or phone, if possible. |
| **Outside Office** | Hour **Phone** | (618)453-8400 |
| **Email**        | [LGBU@SIU.EDU](mailto:LGBU@SIU.EDU)  
or LingguoBu@gmail.com | **Subject: CI220Fall2014**  
You must identify yourself by name. |
| **Online Course** | **Space** | online.siu.edu |
| **Teaching Assistant** | David Hovorka: [djhovorka@siu.edu](mailto:djhovorka@siu.edu)  
Office: Wham 321A  
Office Hours: 10:00 am – 11:00 pm, MTR, or by appointment. |
Catalog Description:

Modern approaches to mathematics instruction for the elementary grades. Mathematics content focuses on rational and irrational numbers, ordering of numbers, decimal representations, percents, ratio and proportion, perimeter and area concepts, Pythagorean Theorem, concept of square root and nth root, exponent notation, elementary geometry, triangles, quadrilaterals, polygons, angles associated with a polygon, reflectional and rotational symmetry, congruence and similarity, tessellations, transformations (translations, rotations, reflections), measurement of perimeter, area, surface, area, volume, mass, temperature, conversion of measurements. Emphasis is placed throughout on reasoning, multiple representations of mathematical concepts, making connections and communication. Prerequisite CI/Math120.

Overarching expectation of students

1) Do not be spectators of mathematics teaching and learning; so participate actively in the class and learn from others.
2) Take responsibility for your own learning.
3) Reflect constantly on your own learning and make changes to best achieve your goals.
4) Be professional, be honest, be punctual, be courteous, and be inquisitive as a member of the learning community.
5) Know that no errors or misconceptions are too big in the classroom.
6) Try to understand and make yourself understood by the community.
7) Try to understand and strive to teach mathematics in accordance with the new State standards.

Overarching assumptions

1) Learning is essentially an active social participation. Teaching supports and facilitates learning but does not guarantee learning.
2) Mathematics is essentially a human endeavor of sense-making. Your mathematical understanding is deeply rooted in your past and current experiences. To understand, you have to experience and monitor the emotional aspects of learning process--curiosity, frustration, perseverance, enlightenment, and mathematical beauty. There is always one more step to take as a learner and as a teacher.
3) There is an immense diversity in our (you and me) mathematical reasoning and problem solving, which should be highly valued by the community. Your story about a mathematical idea (while it might be incomplete or wrong) deserves to be respected and extended by the community.
4) The instructor is a human learner after all; he makes mistakes and is in need of your assistance.
5) Everyone has the right and freedom to make mistakes and ask questions. One can help herself or himself and others by seeking help.
What is Learning (Mathematics)?

Often I have had students asking how they could be successful in this type of class or any class. There is no straightforward answer to such a good question. As you take courses in education, I strongly encourage all of you to make connections between learning/educational theories, the various disciplines, your own learning, and the components of this class. Indeed, human learning is a highly complex process, requiring long-term commitments and reflection. And frequently, we come back to the same old (math) topic to find more about it and its relations with other ideas. That makes learning (math) an appealing phenomenon to think about. In short, learning means making changes, and changes are usually effortful and frequently painful because of our habits of mind. The following figure is an illustration about some essential aspects of learning, which are almost always true in learning new math ideas.

“There is just one infallible teaching method: if the teacher is bored by his subject, his whole class will be infallibly bored by it.” (George Polya)

"If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is." (John von Neumann)

"A mathematician, like a painter or a poet, is a maker of patterns. If his patterns are more permanent than theirs, it is because they are made with ideas. A painter makes patterns with shapes and colours, a poet with words." (G. Hardy)

“That student is taught the best who is told the least.” (R. L. Moore)
Content in the Course

[Subject to changes in response to students’ specific needs, class schedule, and program requirements.]

1. Introduction to Problem Solving/Mathematical Inquiry
   a. CCSS Standards for math practices
   b. General strategies, relevance of emotions, and self-assessment/regulation
   c. Integrating arithmetic, algebra, geometry, and data analysis
   d. Strategic use of tools
2. Numbers & Operations in Base Ten
   a. Base Ten system
   b. Divisibility
   c. Ordering numbers in multiple representations
3. Ratios & Proportions
   a. Use of percents in context
   b. Modeling proportions using language and diagrams
4. Elementary geometry
   a. Identification of planar figures
   b. Areas of rectangles, triangles, parallelograms, trapezoids, and circles
   c. Geometric transformation (reflection, rotation, translation, and dilation)
   d. Congruence and similarity
   e. Pythagorean Theorem and its applications
5. Data analysis
   a. Descriptive data analysis tools: box plots, bar graphs, leaf-stem, etc.
   b. Using technology to explore diverse ways of data analysis

Assessment of students

1) Attendance is critically important!
2) Keep a personal, well-organized notebook to monitor your own progress in the course.
   This notebook will be checked for its presence in class around mid-term and before the final.
3) Quizzes (on class work, with or without announcement beforehand). No makeup quizzes offered for any reason!
4) Mid-term exam [in-class].
5) Comprehensive final exam.
6) Reading.
7) Instructor’s subjective evaluation of students’ participation and attitudes.
8) Homework assignments – problem sets, to be completed on time even if not collected.
9) Research problem & presentation.
Ground Rules

1) Come to every class session on time. **Being five minutes late is still late and will be counted as an absence** except for medical reasons and emergencies (official documentation required).

2) Starting from the 2nd week, the final grade will drop one letter for every three (3) hours of unexcused absence, starting from 2nd week. **The 7th unexcused absence will result in an automatic F**, in which case a student is advised to drop the class as soon as possible. The student is responsible for meeting all the university deadlines for registration, drop/add, etc. So keep a record of your own absences.

3) **If you don’t plan to come to class AND do the work, please drop the class as soon as possible.**

4) Follow the Student Conduct Code that is in your student handbook and/or university policies.

5) Complete all course work – there will be no grade assigned until all coursework is handed in.

6) Even if you are absent from class, you are still expected to turn in all homework on time except for extreme cases (official documents required). Given the ongoing nature of the class, no late homework, quizzes, or reading summaries will be accepted for a grade. The instructor will still want to go over such work and advise students to complete them for inclusion in the notebook.

7) Maintain an appropriate professional disposition at all times. You cannot use cell phones, text messaging devices above the board or under the desk; you cannot stay in class and do your homework, whether it is related to this course or not; you cannot sleep in class; you cannot stay in class and show no signs of participation (under the influence of substances, reading irrelevant stuff, day dreaming, staring at an empty desk, etc). Students who could not maintain professional behavior in class, should talk to your counselor and are advised to drop the class as soon as possible. There may be university resources that can help, please talk to your advisor immediately. If it is related to a medical condition, please let me know before class so that I could best accommodate your special needs in accordance with university policies.

8) All students are required to take the final exam. “**Incomplete**” will only be assigned when a student is passing the course and a notice is given to the instructor before the final exam or 12 hours after the final if a student misses the final because of a documented emergency. The **incomplete grade agreement form** must be processed (http://cteapps.siu.edu/pvc/INC_Grade_Agreement_May2013.pdf).
Grading Policies

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<thead>
<tr>
<th>Attendance*</th>
<th>Final grade will drop one letter for every three (3) hours of unexcused absence, starting from 2nd week. <strong>The 7th unexcused absence will result in an F.</strong></th>
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<tr>
<td>Midterm Exam</td>
<td>35 points</td>
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<td>Final Exam</td>
<td>30 points</td>
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<td>Quizzes</td>
<td>10 points</td>
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<td>Reading Summaries</td>
<td>10 points</td>
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<td>Research/Inquiry Problem</td>
<td>10 points</td>
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<td>Participation</td>
<td>5 points</td>
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Letter grades: A: >=90 pt; B: >=80 pt, C: >= 70 pt; D: >=60 pt.; F <60 pt.

**NO EXTRA CREDIT work will be given before or after the final exam.**
Textbook, References, Technology, and Tools

1. [Recommended Textbook]

2. [References]
   d. Research/Reading Resources: [http://illuminations.nctm.org](http://illuminations.nctm.org)

3. [Selected articles] (details to be announced in class or posted at course web site)

4. [Technology]
   a. GeoGebra at [www.geogebra.org](http://www.geogebra.org) (open source, free to all)

5. [Tools, REQUIRED]: A set of ruler, protractor, triangles, compass, adhesive tapes, safety scissors, 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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<tr>
<th>DSS SIUC, Woody Hall B-150 Carbondale, IL 62901 Mail code 4705</th>
<th><a href="mailto:DSSsiu@siu.edu">DSSsiu@siu.edu</a></th>
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<td>Ph: (618) 453-5738 Fax: (618) 453-5700 TTY: (618) 453-2293</td>
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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, 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.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.

University-wide syllabus attachment
In case of discrepancies between the above and the university-wide syllabus attachment, please comply with the latter.
Attachment A: Self-Assessment Form

Please keep a record of important things related to this Course. This form must be available when you check your grades with the instructor.

<table>
<thead>
<tr>
<th>Homework Description</th>
<th>Date of Completion</th>
<th>Reading Description</th>
<th>Date of Completion (mm/dd/yyyy)</th>
<th>Date of Absence</th>
<th>Reason</th>
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Attachment B: University-Wide Syllabus Attachment