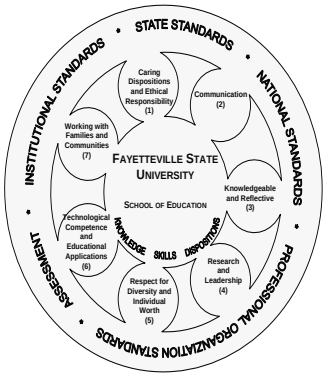



**Fayetteville State University**
**School of Education**
**Department of Elementary Education**

## Undergraduate

## 1. LOCATOR INFORMATION

Instructor: Dr. Geraldine Campbell Munn, Associate Professor
Department of Elementary Education
gmunn@uncfsu.edu

| | |
|---|---|
| Course Number and Name: | ELEM 335: Math for 21st Century K-6 Teaching |
| Semester: | Spring 2012 |
| Credit Hours: | 3 semester hours |
| Course Location & Meeting Time: | Tuesday 6:00 PM – 8:50 PM – BU359<br>Thursday 6:00 PM – 8:50 PM – BU211 |
| Office Hours: | Butler 344<br>Tuesday 2:00 PM – 6:00 PM<br>Thursday 2:00 PM – 6:00 PM |

## 2. FSU Policy on Electronic Mail

Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and

requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Rules and regulations governing the use of FSU email may be found at:
http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

## 3. DESCRIPTION

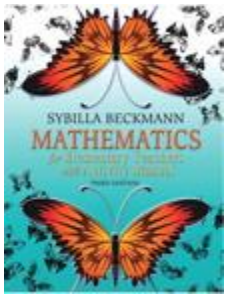
This is a course in mathematics content for future elementary teachers. It is designed to improve, broaden and deepen the preservice educator's proficiency and understanding of mathematics, and to help them acquire the specialized mathematical knowledge necessary for teaching students in kindergarten through sixth grade. Problem solving is integrated throughout the topics of operations, algebraic thinking, place value, measurement, data, and geometry giving future elementary school teachers tools to further explore mathematical content required to convey the usefulness, beauty and power of mathematics to their own students.

Prerequisite: Admission to teacher education.

## 4. Disabled Student Services:

In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st floor), 910.672.1203.

## 5. TEXTBOOK




**Mathematics for Elementary Teachers with Activity Manual, 3/E**

**Sybilla Beckmann**
ISBN-10: 0321654277
ISBN-13: 9780321654274

## 6. SCHOOL OF EDUCATION'S CONCEPTUAL FRAMEWORK

The conceptual framework of the School of Education is reflected in this course and establishes a shared vision of its efforts in preparing educators to work effectively in P-12 schools. It defines the educator as a *Facilitator of Learning*, one who seeks to make the learning process accessible and one who enables learning to take place successfully. This presupposes that the educator is reflective and serves as a catalyst, stimulator, and motivator of the teaching for learning process. The conceptual framework defines the unit's vision which underscores the school's purpose for preparing its candidates for teaching and leadership roles in a global society. The unit prepares candidates who support student learning, within the context of family and community participation, for a diverse, technological, and global society. We achieve this vision through teaching, research, and service. Our conceptual framework serves as a lens through which we view our education professionals in the music program. The themes of our conceptual framework are: (1) caring dispositions and ethical responsibility; (2) communication; (3) knowledgeable and reflective educators; (4) research and leadership; (5) respect for diversity and individual worth; (6) technological competence and educational applications; and (7) working with families and communities.

## 7. COURSE GOALS AND OBJECTIVES

Upon completion of this course the facilitator of learning will have achieved the following competencies and will be able to demonstrate the acquired competencies at a proficiency level of 80% or higher.

1. Come to view arithmetic (and algebra) as a small, unified, coherent, consistent subject that all makes sense.

2. Appreciate the importance of developing clear, explicit, grade-appropriate definitions and using logical reasoning to arrive at unambiguous conclusions.

3. Experience and do real mathematics, by struggling with problems that have multiple steps, logical challenges, and non-obvious solutions.

4. Acquire habits of mathematical thinking: reasoning, conjecturing, visualizing, analyzing, estimating, exploring, justifying, and constantly probing with —Why?

5. Traverse many levels of abstraction: from marks on a wall to Roman numerals to place value to scientific notation; from numbers to variables (a central abstraction of algebra) to functions.

6. Gain the competence and confidence to analyze their students' mathematical thinking and engage them in productive mathematical discourse.

## 8. NORTH CAROLINA PROFESSIONAL TEACHING STANDARDS

| Standards Used in this Course | Assessment (s) |
|---|---|
| Standard I: Teachers demonstrate leadership | • Chapter Assignments |
| Standard II: Teachers establish a respectful environment for a diverse population of students | • Diversity in the Classroom |
| Standard III: Teachers know the content they teach. | • Classroom Activities<br>• Chapter Tests<br>• Research Assignment<br>• Team Presentation |
| Standard IV: Teachers facilitate learning for their students | • Chapter Activities |
| Standard V: Teachers reflect on their practice | • Research Assignment<br>• Team Presentation |

## 9. Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education

http://www.ala.org/ala/mgrps/divs/acrl/standards/standards.pdf

| Standards Used in This Course | Assessment (s) |
|---|---|
| STANDARD 1:<br>The information literate student determines the nature and extent of the information needed. | Research Assignment:<br>• Students identify research topics from approved list.<br>• Students identify information sources. |
| STANDARD 2:<br>The information literate student accesses needed information effectively and efficiently. | Research Assignment:<br>• Students select appropriate research methods or information retrieval systems. |

| | |
|---|---|
| STANDARD 3:<br>The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system. | Research Assignment:<br>• Students construct an annotated bibliography. |
| STANDARD 4:<br>The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose. | Research Assignment:<br>• Students will research an assigned topic using a variety of sources and technologies. |
| STANDARD 5:<br>The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally. | Research Assignment:<br>• Students understand the meaning and consequences of plagiarism.<br>• Students appropriately documents and cites sources |

## 10. CONCEPTUAL FRAMEWORK THEMES

| **Themes used in this course** | **Assessments (s)** |
|---|---|
| Caring dispositions and ethical responsibility | • Class Assignments |
| Communication | • Class Assignments |
| Knowledgeable and reflective educators | • Research Assignment |
| Research and leadership | • Research Assignment<br>• Team Presentation |
| Respect for diversity and individual worth | • Research Assignment |
| Technological competence and educational applications | • Research Assignment<br>• Team Presentation |
| Working with families and communities | |

## 11. DEPARTMENTAL LEARNING OUTCOMES AND ASSESSMENTS

| | |
|---|---|
| Teacher candidates will know | • Classroom Activities |

| | |
|---|---|
| their content based on the North Carolina Standard Course of Study, State Standards and CAEP. | • Chapter Tests<br>• Research Assignment<br>• Team Presentation |
| Teacher candidates will know how to teach based on the North Carolina Standard Course of Study, State Standards, and CAEP. | • Classroom Activities<br>• Chapter Tests<br>• Research Assignment<br>• Team Presentation |
| Teacher candidates will implement practices that reflect the cognitive, mental, and physical development of P-6 students. | • Classroom Activities<br>• Chapter Tests<br>• Research Assignment<br>• Team Presentation |
| Teacher candidates will know how to utilize technology to enhance instruction, learning, research, assessment, and data management. | • Team Presentation |
| Teacher candidates will demonstrate leadership skills through the establishment of a safe, orderly, and positive environment. | • Team Presentation |
| Teacher candidates will provide appropriate accommodations and implement teaching strategies for diverse learners. | • Classroom Activities<br>• Chapter Tests<br>• Research Assignment<br>• Team Presentation |
| Teacher candidates will integrate 21st century knowledge and skills | • Classroom Activities<br>• Chapter Tests |

| | |
|---|---|
| in instruction | • Research Assignment<br>• Team Presentation |
| Teacher candidates will be able to communicate effectively and be reflective practitioners. | • Team Presentation |

## 12. TECHNOLOGY

This course will help strengthen and enhance the candidates' technological competence and skill in using technology. Candidates will use a variety of technologies to enhance their knowledge of technology in this course. Some technologies for this course may include: productivity tool (Power Point, presentation software), Internet, e-mail, and on-line course applications.

| | **Technological Applications for this Course** |
|---|---|
| X | Productivity tool (Power Point) |
| X | Presentation software |
| X | Internet |
| X | e-mail |
| X | On-line applications |
| X | Smart board |

| **Technology Standards Used in this Course** | **NCDPI Technology Standards** | **Assessment(s)** |
|---|---|---|
| X | 1. Teachers demonstrate a sound understanding of technology operations and concepts. | Online Tests |
| X | 2. Teachers plan and design effective learning environments and experiences supported by technology. | Team Presentation |
| X | 5. Teachers use technology to enhance their productivity and professional practice. | Internet Research |
| X | 6. Teachers understand the social, ethical, legal and human issues surrounding the use of technology in PK-12 | Class Assignment |

| | | |
|---|---|---|
| | schools and apply those principles in practice. | |

## 13. DISPOSITIONS

Dispositions will be addressed through readings, modeling, reflecting, field experiences, discussion and other approaches. This course will seek to enhance and strengthen the dispositions listed below.

| **Professional Competence** | | **Professional Responsibilities** | |
|---|---|---|---|
| X | Appreciates and engages in self-reflection | X | Dresses appropriately for the setting |
| X | Shows a commitment to ongoing learning | X | Is punctual |
| X | Desires to learn and apply new technologies | X | Attends class regularly and participates in the class |
| X | Is receptive to new ideas and feedback | X | Completes assignments and tasks in a timely manner |
| X | Writes and speaks clearly and effectively | X | Willing to go beyond required assignments |
| X | Uses culturally sensitive language when communicating with families | X | Shows initiative and motivation |
| X | Respects the privacy of students and their families | X | Assumes fair share of responsibilities |

## 14. EVALUATION CRITERIA and COURSE ASSIGNMENTS

**EVALUATION:** The final grade you receive in this course will reflect how accurately you complete the chapter activities, examinations, and group assignments. Please submit each learning activity **typed and double-spaced** on the appropriate due date. Dr. Munn **does not grade** handwritten assignments. **Turning in assignments late will result in a fifteen-point penalty deduction. Additionally, late assignments are accepted only at the discretion of the professor.** You will receive a score for each of the written activities. An average of scores from these activities, credit for presentations, professional development activities, and test scores will determine your final grade.

| GRADING | SCALE |
|---|---|
| **A** | **100 - 92** |
| **B** | **91 – 83** |
| **C** | **82 – 73** |
| **D** | **72 – 64** |
| **F** | **63 or less** |

Class attendance is extremely important. Much of the content required for this class will receive its foundation through class presentations and interactive

activities. **Your participation in all classes will allow you to develop a comprehensive understanding of course competencies.** You cannot participate if you are absent. Therefore, students who miss more than two classes are not qualified for an "A" grade. Students who miss more than three classes are ineligible for a "B" grade. Students who miss more than four classes will receive a grade lower than a "C". For your information, an education major earning a grade lower than a "C" in an education course is required to repeat the course.

Without prior permission, students arriving fifteen minutes or more after the start time are considered absent. Students leaving fifteen or more minutes before the official end of class are counted absent for the entire session. When other commitments sometimes draw students away from class, students remain responsible for missed content.

Assignments are due on the posted dates. Absences do not affect assignment due dates.

**COURSE REQUIREMENTS/ASSIGNMENTS:**

**Participation**: Your presence and participation in class activities and discussions are important. Arrive on time, be prepared, be a collaborative group member, and do not leave early.

**Chapter Assignments/Quizzes:** A homework quiz will be given approximately once a week. This quiz will be based on the homework you completed for that day. The questions on the homework quiz will be one of four types: 1. Problems taken directly from the homework; 2. Problems that are similar to ones you completed for homework; 3. Questions about how changing some part(s) of the problem will impact the solution; and/or 4. Explanation of the problems you did for homework.

**Exams:** Administered according to course calendar.

**Research Assignment** – **Due February 28/March 1, 2012**

- **Annotated Bibliography** – **Due January 31/February 2, 2012**
  http://olinuris.library.cornell.edu/ref/research/skill28.htm#what

Students enrolled in ELEM 335 are required write a three to five page research paper on one of the topics listed below. Points are deducted from papers that exceed five pages or are shorter than three pages.

Elementary educators are required to know and teach a multiplicity of content areas. They must especially know mathematics and how children learn mathematics. This research assignment will help preservice elementary educators expand their knowledge of mathematics.

Students will use a variety of sources to research information about their chosen topic. While the information highway is broad, you must find what is useful among the different kinds of information available to you. As a researcher, you must separate fact from fiction and also determine what is relevant and what is reliable. Students will synthesize not plagiarize. Refuse to restate the author's words but use the author's information to help write what new knowledge has been gained about the assigned topics. Remember that presentation matters. As preservice teachers and **first-class** students, researchers should deliver content that is free of grammatical, spelling, formatting, punctuation, and any other errors.

As researcher, you must utilize a minimum of four ***different*** types of sources.

- Encyclopedia (Due to its fluid nature, students may not use Wikipedia.)
- Internet sources (Not more than two)
- Books
- Professional Journals
- Others as approved by the instructor(s).

Please note you must submit your annotated bibliography, http://olinuris.library.cornell.edu/ref/research/skill28.htm#what on **January 31/February 2, 2012.**

Do not wait until the last minute. Begin your work today!

- **Research Topics:**

Formative Assessment
Summative Assessment
National Council of Teachers of Mathematics
Overcoming Math Anxiety
Place Value
Characteristics of Good Problem Solvers
Evolution of the Calendar
Symmetry Patterns in Everyday Life
History of the Magic Square
Cooperative Learning and Mathematics
Counting Techniques
Probability
Multicultural Mathematics
Roman Numerals
Mathematics and Art
The Development of Numbers
The History of Mathematics
Quilting and Geometry
Benjamin Banneker
Mathematics Journals
Algebraic Thinking
Number Theory

Geometry and Architecture
Teaching Mathematics Using Literature
Teaching Gifted and Talented Students
Common Core State Standards for Mathematics
Using SmartBoard Technology to Teach K-6 Mathematics
The ABC's of Public Education
Time
The Pythagorean Theorem

Students will post the completed research paper to Blackboard's Discussion Board and turn in a hard copy on or before **February 28/March 1, 2012**. Each student is **required** to read and evaluate a peer's research paper, complete a scoring rubric, and e-mail the rubric to the author copying Dr. Munn.

**For Your Assistance** –The University staffs a Writing Center to provide assistance to students desiring help with writing assignments. The FSU Writing Center is part of the University College Learning Center, located in the basement level of the Helen T. Chick Building, Room 001B.
http://www.uncfsu.edu/learningcenter/writingcenter/

**Research Roundtable – February 28/March 1, 2012**

Students will present an oral five minute discussion of their research topic to the class and entertain questions.

**Team Presentation** – Students, in their groups, will make a chapter presentation to the class. The purpose of the presentation is to demonstrate content mastery of the assigned topic in elementary school mathematics, demonstrate skill in developing a lesson plan and presenting a lesson, demonstrate understanding of and sensitivity to teaching all children, demonstrate understanding of assessment, and to review or re-teach the chosen material to the remainder of the class. Presentations should be in the form of a lesson for our class (not an elementary school class). Each lesson presented should include 1) a manipulatives component, 2) an assessment of the material covered in the lesson (but the assessment will be in the report and will not be administered), 3) a discussion about how the specific lesson provided could be differentiated to meet the needs of students with ADHD, include content to meet the needs of culturally diverse students, and 4) an activity that involves the class, including a handout for each member of the class. **All** group members should share equally in the planning and delivery of the Team Presentation.

At the start of the presentation, the group should provide to the instructor, a binder containing the lesson plan for the presentation, and any other materials relevant to producing the lesson, and a list of references directing the instructor to the source of these materials. Plan to use a variety of sources.

On **February 28/March 1, 2012**, three weeks before the first team

presentation (see schedule) each group must submit to the instructor, in writing, a preferred presentation topic and a list of sub-topics that will be covered in the Team Presentation. Thirty minutes at the end of the class will be reserved for group work on the presentation outline.

On **March 13/15, 2012,** two weeks before the first team presentation an outline of the presentation is due. The outline will include a summary of the presentation including:
1) A description of the activities and mathematical concepts that will be presented,
2) A delineation of who will present each of the activities,
3) A discussion of what manipulatives will be used in the presentation and how they will be used, and

On **March 20/22, 2012**, one week before the first Team Presentation a detailed description of the presentation is due, including a sample of what will be covered, and a draft lesson plan. Presentation descriptions will be reviewed and modifications will be suggested if necessary. A team representative is responsible for e-mailing one copy of the detailed description to Dr. Munn.

Before the presentation begins, a summative report is due to the instructor. It will include all items mentioned above as well as a detailed portfolio covering the presentation. The report should be one, unified seamless group report, not a collection of reports from individual group members. Presenters should be prepared to answer questions from class members and the instructor.

The Team Presentation grade will be based on how well group members convey understanding of the topic, the quality of the lesson plan, the quality and completeness of the final report, and the quality of the presentation. A rubric for the Team Presentation is included.

**Team Presentation Schedule (all items due in writing)**

| | |
|---|---|
| **Feb 28/Mar 1, 2012** | General Outline of Project and Major Concepts Due |
| **March 13/15, 2012** | Detailed Project Outline Due |
| **March 20/22, 2012** | Detailed Presentation Description Due |
| **April 3/5, 2012** | Team Presentation and Final Report, and Handouts |


# COURSE CALENDAR Spring 2012

| Dates | Assignments/Topics |
|---|---|
| **January 10/12, 2012** | Introductions |
| | Syllabus Review |
| | • Course Requirements |
| | • Attendance Policy |
| | • Working Teams |
| | • Research Assignment |
| | • Group Team Presentation |
| | • Chapter Quizzes |
| | Weekly Class Assignments/Homework<br>• Read each chapter according to the course calendar. |
| | • Review practice exercises |
| | http://www.ncpublicschools.org/accountability/testing/eog/sampleitems/math |
| | http://www.corestandards.org/the-standards/mathematics/introduction/standards-for-mathematical-practice/ |

| Dates | Assignments/Topics |
|---|---|
| **January 17/19, 2012** | Chapter 1: Numbers and the Decimal |
| **January 24, 2012** | Guest Speaker: How Common Core State Standards Will Impact Teaching in the 21st Century Classroom?<br>Chapter 2: Fractions (Blackboard) |
| **Jan 31/Feb 2, 2012** | Chapter 3: Addition and Subtraction |
| **February 7/9, 2012** | Chapter 4: Multiplication |
| **February 14/16, 2012** | Chapter 5: Multiplication of Fractions, Decimals, and Negative Numbers (Blackboard) |
| **February 21/23, 2012** | Chapter 6: Division |

| | |
|---|---|
| | Take home mid-term examination (Chapters 1-6)<br>Return on February 28/Mar 1, 2012. |
| **Feb 28/Mar 1, 2012** | Research Roundtable<br>Working Teams Meet (8:15 PM) |
| **March 13/15, 2012** | Chapter 7: Combining Multiplication and Division: Proportional Reasoning |
| **March 20/22, 2012** | Chapter 8: Number Theory (Blackboard) |
| **March 27/29, 2012** | Chapter 9: Algebra |
| **April 3/5, 2012** | Chapter 10: Geometry - Soccer Team |
| **April 10/12, 2012** | Chapter 11: Measurement – Baseball Team |
| **April 17/19, 2012** | Chapter 15: Statistics – Football Team |
| **April 24/26, 2012** | Chapter 16: Probability – Basketball Team |
| **May 1/3, 2012** | Final Examination (Chapters 7-11 and 15-16) |

# WORKING TEAMS

**ELEM 335-01 Thursday 6:00 PM – 8:50 PM**

|  SOCCER |  BASEBALL |  FOOTBALL |  BASKETBALL |
|---|---|---|---|
| Gloristine Allen | Phairleania Brice | Jacqueline Carmichael | Stephanie Galan |
| Bonnie Hatton | Kim Hudson | Heidi Jacobs | Annie Kelly |
| Marcelious Lundsford | Sadainya Martin | Peter Rivera | Linda Russell |
| | | Rose Shefton | |

**ELEM 335-02 Tuesday 6:00 PM – 8:50 PM**

|  SOCCER |  BASEBALL |  FOOTBALL |  BASKETBALL |
|---|---|---|---|
| Ashley Bass | Lydia Bowers | Nadiyah Brooks | LaParish Brown |
| Amanda Carter | William Cassady | Danielle Cochran | Ronda Darby |
| Kimberly Dixon | Lakeisha Elliott | Janice Flora | Kelly Fletcher |
| Adrienne Greenfield | Katherine Grubbs | Rochel Hall | Briana Jones |
| Angela Lane | Barbara Lewis | Whittany McAllister | Helen McReynolds |
| Damon Percy | Richard Robinson | Dennis Shamblin | Jessica Talley |
| Mareda Torrence | | | |

## CHEATING

You are encouraged to study and work together in this course. However, when you present homework, quizzes, reflections, projects or other materials under your name, you are stating that you produced their contents. All instances of cheating will result in failure, in accordance with University policy.

## REFERENCES


Bennett, Albert B. Mathematics for elementary teachers: a conceptual approach. 5th ed. Boston: McGraw-Hill, c2001.

Charlesworth, Rosalind. Experiences in math for young children. 4th ed. Albany, N.Y.: Delmar c2000

Chazan, Daniel. Implementing standards-based mathematics instructions: a casebook for professional development. National Council of Teachers of Mathematics/Teacher College Press, 200

Mandy, Joan Ferrin. Making change in mathematics education: learning from the field. NTCM, 1998

Miller, Don. The Beginning School mathematics Project: a case study of school-university collaboration for improving children's learning of mathematics in the first three years of school. Alexandria, VA: Association for Supervision and Curriculum Development, c1995.

Overholt, James L. Big math activities for young children for preschool, kindergarten, and primary children. Albany, N.Y. Delmar Publishers, 1998.

Riedesel, C. Alan. Teaching Elementary School Mathematics. Englewood Cliffs, NJ: Prentice-Hall, 1990.

Rosalind Charlesworth. Experiences in math for young children. 4th ed. Albany, N.Y. Delmar, c2000.

Whitin, David Jackman. Living and Learning Mathematics. Portsmouth, NH: Heinemann, 1990.

Whitin, Phyllis. Math is language too: talking and writing in the mathematics classroom. Urbana, Ill: National Council of Teachers of English c2000.

PERIODICALS

Arithmetic Teacher
Exceptional Children
The Gifted Child Today
The Journal of Computers in Mathematics and Science Teaching
Journal of Learning Disabilities
Journal for Research in Mathematics Education
Mathematics Teacher
New Directions for Teaching and Learning
Teaching Exceptional Children
Current Index of Journals of Education (CIJE)
Educational Resources Information Center (ERIC)
Mathematical Reviews
Mathematics and Computer Education
Mathematics of Operations Research