MAT 321A&B Mathematical Inquiry in Early Childhood Education Fall 2014

Class Location:
Instructor:
Office:
Email:
Phone:

Class Time: MWF 10-10:50am A, 11-11:50am B
Office Hours:

Course Description: Development of elementary mathematical concepts including: (1) number theory as related to number sense, place value, operations and estimation; (2) geometry learning theory and concepts; and (3) algebraic thinking. Mathematics education topics regarding national and state standards, process standards, assessment techniques and current topics pertaining to early childhood education. Field experience is a required component of this course. Pre-requisites: MAT 220 and admittance to teacher education program.

Textbooks:

(Required) Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2012). *Elementary and Middle School Mathematics: Teaching Developmentally* (7th ed.). Boston: Allyn & Bacon.

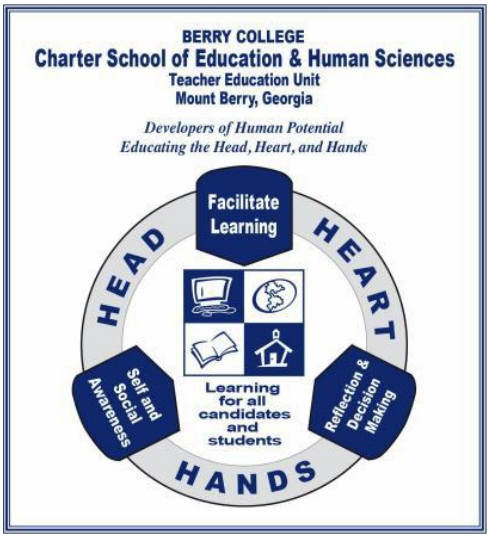
(Recommended) National Council of Teachers of Mathematics (2000). Principles and Standards for Schools Mathematics. Reston, VA. (Free trial available online through nctm.org)

Purpose of the Course: The purpose of this course is to promote reflection and decision-making about learning environments, mathematical tasks, and questioning strategies. Students should gain through this course sound knowledge of subject matter content so that they will be able to present that content accurately, equitably, and in ways that make connections within mathematics and to other subject areas. The focus will be on pedagogical content knowledge, which is not only content knowledge and methods of instruction, but specific knowledge related to teaching mathematics. This course is designed around the conceptual framework of the Teacher Education Unit, which is as follows:

We believe that teachers are **"Developers of Human Potential."** Like Martha Berry, we believe the role of excellent teachers is to help our candidates and the students they teach to reach their full potential by developing their **head, heart and hands**. Our philosophy and purposes are based on three dimensions to develop teachers and educational leaders who **1) Promote Reflection and Decision Making (head), 2) Facilitate Learning (hands)**, and **3) Enhance Self and Social Awareness (heart)**. Each of these dimensions is tied to one or more of the 10 program principles and is demonstrated by our candidates in the coursework, field and clinical experiences.

Applicable Teacher Education Program INTASC Principles

4. **Content Knowledge (Head):** The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. **Application of Content (Hands):** The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. **Assessment (Head):** The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. **Planning for Instruction (Hands):** The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.



8. **Instructional Strategies (Hands):** The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Student Learning Outcomes: Upon completion of the course, students will be able to:

1. Articulate mathematical understanding and development in topics of number sense, counting, operations, computations, estimation and geometry including state and national standards. (INTASC 4)
2. Communicate and connect mathematical ideas using multiple representations such as objects, verbally and symbolically. (INTASC 5)
3. Design, facilitate and assess learning for individual and whole class settings using appropriate mathematical instruction strategies. (INTASC 6, 7, 8)

State and National Standards: In class discussions and assignments, information about what is appropriate at each grade level and the development will primarily be the Common Core State Standards for Georgia with a secondary resource of the Principles and Standards from the National Council of Teachers of Mathematics.

Course Policies: All students are expected to abide by the following:

Attendance Policy: All students are expected to attend class every day. If you are not in class on any given day, it is your responsibility to **notify me in advance** and make arrangements to make up any material you might have missed. In addition to being to be in class, you are expected to be in class on time. Absences in excess of six days may be grounds for administrative withdrawal from the course. Excessive tardies may count as absences.

Academic Integrity: Academic dishonesty will not be tolerated (see Viking Code). All work that you turn in must be your own. You may discuss concepts with other students, but you may not copy their work or allow them to copy yours. If you are not sure about whether something falls under the umbrella of "academic dishonesty," please ask. Additionally, any resources used to plan lessons or other assignments must be documented appropriately giving due credit.

Assignments: If your homework or other assignments contain solutions that appear to have been copied from any source, or are similar to another student's without attribution, then you will receive a negative score for that assignment. If you work with another student on homework you must each write up your solutions in your own words and identify that person on the submitted assignment. A simple statement such as "I worked with _____on exercises 1-4" will suffice.

Exams: Any unauthorized collaboration on an exam will result in a grade of zero (0) for the exam and possibly a grade of F for the course.

Distractions: Distractions take many forms.

- Food should not be eaten during class, especially since we meet in a computer lab.
- Laptops are only permitted as they pertain to the class activity.
- Cell phones should be turned off or on vibrate if absolutely necessary, but out of sight. Moreover, during an exam, your cell phone in not to be used as a timepiece or calculator, it is to remain off and out of sight.

Methods of Instruction: As mathematical content is developed, the emphasis will be on investigating, inquiring, problem-solving, reasoning, and communicating. Rather than "lecture," the instruction will be characterized by interaction. Many opportunities will be given to manipulate various mathematical learning tools including technology. Reflection on experiences both pertaining to the mathematical content and pedagogical issues will be encouraged.

Assistance and Tutoring: Just as you would not conceal a health problem from you doctor, you should not conceal any problems with your understanding of the course material from me. You may find yourself struggling with learning new concepts from time to time. This is not a bad thing, as very few worthwhile pursuits are ever easy. **When** you find yourself having trouble with the concepts or the homework, please come talk to me. If you

would like, the math department also provides a tutoring center where other students will be able to answer questions **about math**. This is in McAllister 348.

The Berry College **Writing Center**, located on the second floor of the Memorial Library, offers free tutoring to students in any discipline. The Center is staffed by writing consultants who have taken a course in tutoring and who can help with any part of the writing process. Walk-ins are welcome but appointments do receive priority scheduling. To make an appointment, go to College's homepage and access the Writing Center under the Quick Links menu.

Assessment Measures: Your grade is performance-based and will be determined using the following measures:

Participation: It is expected that you will be an active member of the class who comes prepared to class and participates in class activities and discussions. Your participation will be assessed in the following ways: participation in discussions, in-class assignments, and exit slips. Participation grades will not be taken every day. If you miss one due to an absence, excused or unexcused, you will not be permitted to make it up.

Content Application Homework: Homework will be given as packets, one for each content unit. These packets will generally be due the class period after we complete the unit. It is expected that you will work on the homework throughout the unit. Some of the homework assignments are meant to be challenging. As part of the homework process I encourage you to talk to classmates about their attempts and **come see me** so that I can help guide your thoughts *before* the assignment is due. All homework will be graded on **accuracy, reasonableness and communication**.

Field Experience: The field experience that you will have this semester will give you the opportunity to experience classrooms with focus on a variety of subjects. It is anticipated that you will have the opportunity to observe or participate in a least a few math lessons throughout the semester. This is a good time to apply the knowledge of concepts studied in class to real students in real classrooms. During the week that you are exclusively in these - classrooms (Oct. 27-31), you will have two additional assignments. One will involve teaching a **math workshop lesson** to a whole class to practice an instructional format that focuses on student learning and engagement. The other will include **interviewing a student** to assess their understanding of chosen problems and development of mathematical concepts. More information about the criteria for these assignments and how it will be graded will be given after the first exam. It is suggested for any student not assigned a classroom with math lessons for field experience that you talk to your cooperating teacher early in the semester to arrange another classroom in which you can complete these assignments. For those students not enrolled in EDU 370 alternative arrangements can be made.

In addition to the field experience scheduled through EDU 370, as a class we will be working with classes from the Berry College Elementary School. A tentative date is noted on the class schedule.

Exams: There will be two exams and a comprehensive final exam as marked on the class schedule. Both exams will include a written portion and an oral portion. The purposes for an oral exam are to demonstrate a non-traditional assessment technique while encouraging you to visit me in my office. This form of assessment yields significant information for me about your level of understanding and development of skills in communicating mathematical ideas. You will be given examples of the type of questions as well as a rubric for the exams in order to prepare. The written portions, including your final, will have mostly open-ended questions. Content Application questions are good examples of the type of questions that you can expect on these exams.

Reading: Reading assignments will be given almost every class period. The textbook was chosen as a resource to you for this course and a reference for the future. It is meant to be read. This will make the in-class discussions more meaningful and will give you the opportunity to think about any questions you have. Thus you should plan to read the assigned section **before** class.

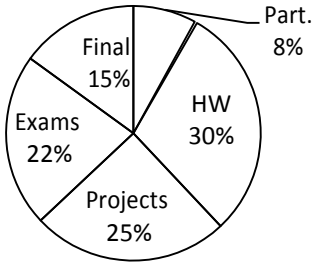
Late work: Late work will only be accepted in cases where arrangements are made with me prior to the due

date/time or in extreme cases where arrangements are made afterward. If arrangements are made, then homework, reading cards, and the paper may be turned in late with 10% reduction in grade for each 24 hours late. Exams will be handled on a case by case basis.

Redo: Homework may be resubmitted for 90% of the new grade if the original grade is lower than 80%. Exams and the papers may not be redone except in extenuating circumstances.

Evaluation Components and Grading Scale: The assessment measures detailed above will contribute to your grades in the following way. The list shows the point value for each assignment, while the pie chart shows the percentages for each category. All upcoming and graded assignments will be posted in VikingWeb. So that at any point during the semester you can determine what your grade is.

Participation	80 pts.
6 Content Application Packets	50 pts. each
2 Projects	125 pts. each
2 Exams	110 pts. each
Final Exam	150 pts.
Total	**1000 pts.**



A	920-1000 points
A-	900-919 points
B+	880-899 points
B	820-879 points
B-	800-819 points
C+	780-799 points
C	720-779 points
C-	700-719 points
D	600-699 points
F	Below 600

A grade below C (including C-) will necessitate you retaking the course

Special Requirement(s): See the "Evaluation Components and Grading Scale" section where you will also find information about the required field experience.

Accommodation Statement: Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Academic Support Center in Memorial Library, First Floor, (706-233-4080) as soon as possible to ensure that such accommodations are implemented in a timely fashion. No student will receive special accommodations without approval from the Academic Support Center.

Instructor's Bibliography:

Aichele, D. B., & Wolfe, J. (2008). *Geometric Structures: An Inquiry-Based Approach for Prospective Elementary and Middle School Teachers.* Upper Saddle River, NJ: Pearson Prentice Hall.

Burger, E. B., & Starbird, M. (2000). *The Heart of Mathematics: An Invitation to Effective Thinking.* Emeryville, CA: Key College.

Johnson, K., Herr, T., & Kysh, J. (2000). *Crossing the River with Dogs: Problem Solving for College Students.* Emeryville, CA: Key College.

Musser, G. L., Burger, W. F., & Peterson, B. E. (2008). *Mathematics for Elementary Teachers: A Contemporary Approach* (8th ed.). Hoboken, NJ: John Wiley & Sons.

Sonnabend, T. (2010). *Mathematics for Teachers: An Interactive Approach for Grades K-8* (4th ed.).

Semester Calendar - Fall 2014

Monday	Tuesday	Wednesday	Thursday	Friday
25-Aug - First day of classes Philosophies and Standards	**26**	**27** Begin Standards and Counting Unit	**28 - Final date to change schedules**	**29**
1-Sep ***Labor Day (no classes)***	**2**	**3**	**4**	**5**
8	**9**	**10 - Final date to withdraw with automatic grade of "W" (1st 7-week classes)** Begin Operations Unit	**11**	**12**
15	**16**	**17**	**18**	**19**
22 Problem-solving	**23**	**24** Math Workshop	**25**	**26 - Final date to withdraw with automatic grade of "W"** **Standards, Counting and Operations Exam**
29 Begin Geometry Unit	**30**	**1-Oct** BCEMS observation (combined)	**2**	**3 - Mountain Day activities - no classes after 2:00pm** No class
6 Geometry cont.	**7**	**8** Geometry cont.	**9**	**10 - First 7-week classes end** Geometry cont.
13 ***Fall Weekend (no classes)***	**14** ***Fall Weekend (no classes)***	**15 - Second 7-week classes begin** Geometry cont.	**16 - Final drop/add date (2nd 7-week classes)**	**17** Geometry cont.
20 Assessment	**21**	**22** Assessment	**23**	**24** Geometry cont. **Lesson Plan Rough Draft Due**
27 - Advisement - Week 1 **Senior exit examinations** Geometry cont.	**28**	**29 - Last day to withdraw with W grade (2nd 7-week classes)** **Geometry Exam**	**30**	**31** **Interview Protocol Due**
3-Nov - Advisement - Week 2 **Preregistration begins** ***Week in Schools***	**4**	**5** ***Week in Schools***	**6**	**7** ***Week in Schools***
10 Begin Estimation and Place Value Unit	**11**	**12** **Workshop Report due**	**13**	**14 - Last day to withdraw with a grade of "W" or "WF"**
17	**18**	**19 - Preregistration ends (4:00pm)** Begin Computation Unit	**20**	**21**
24 **Interview Report Due**	**25**	**26** ***Thanksgiving Break (no classes)***	**27** ***Thanksgiving Break (no classes)***	**28** ***Thanksgiving Break (no classes)***
1-Dec	**2**	**3**	**4**	**5 - Last day of classes**
8 - Final Exams Reserved for rescheduled exams: 8:00-10:00 **MWF 11:00 classes: 11:00-1:00** T Th 12:30 classes: 2:00-4:00	**9 - Final Exams** **MWF 10:00 classes: 8:00-10:00** T Th 8:00 classes: 11:00-1:00 T Th 2:00 classes: 2:00-4:00	**10 - Final Exams** T Th 9:30 classes: 8:00-10:00 MWF 8:00 classes: 11:00-1:00 MWF 1:00 classes: 2:00-4:00	**11 - Final Exams** MWF 9:00 classes: 8:00-10:00 T Th 3:30 classes: 11:00-1:00 MWF 12:00 classes: 2:00-4:00	**12 - Final Exams** MWF 2:00 classes: 8:00-10:00 MWF 3:00 classes: 11:00-1:00