STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

American Public University System

The Ultimate Advantage is an Educated Mind

Education
EDU541
Elementary School Mathematics
Credit Hours = 3
Length of Course = 16 weeks
Prerequisites = EDU 502

Instructor Information

Instructor: APUS Faculty

Course Description (Catalog)

This course explores mathematics in the elementary school setting. The class is approached from the following four sections:
1) Higher level mathematical content or educational theory
2) Math content practice or reflection on educational theories
3) Connection between elementary math and the higher level content
4) Best practices for teaching mathematics at the elementary level.

Throughout the course, students will be asked to make connections between higher level mathematics and how that relates to the depth and complexity of the content. Students will then explore those connections through creating practical methods to be used in a class setting. The use of instructional technology and resources as an enhancement to their understanding and teaching of math will also be explored.

Course Scope

In this course students acquire the knowledge, skills, and abilities necessary to make broad connections related to k-12 math curriculum and then narrow the information to particular age groups.

Course Objectives Goals

After successfully completing this course, students will be able to:
1. Explore the following content in relation to pedagogy: Number and Operations, Algebra, Geometry, Measurement and Data Analysis.
2. Examine and participate in mathematics activities appropriate for the k-12 math school classroom.
3. Design mathematics lessons that will use manipulative materials and utilizing the arts help children develop an understanding in one of the explored content areas.
4. Understand and create mathematics lessons, student interviews, and units that utilize the mathematical processes of problem solving, communication, reasoning and proof, representations, and connections.
5. Explore alternative methods for assessing mathematical understanding.
7. Evaluate, create, and utilize technological resources appropriate for mathematics in the elementary and middle school.

**Course Delivery Method**

This course delivered via distance learning will enable students to complete academic work in a flexible manner, completely online. Course materials and access to an online learning management system will be made available to each student. Online assignments are due by Sunday evening of the week as noted and include Forum questions (accomplished in groups through a threaded Forum), and individual assignments (submitted for review by the Faculty Member). Assigned faculty will support the students throughout this eight-week course.

**Course Materials**

Course Textbooks:

**There is one textbook required for this course:**


In addition to the required course texts the following public domain Websites are useful. Please abide by the university’s academic honesty policy when using Internet sources as well. Note Web site addresses are subject to change.

APA Format
http://www.apa.org

NCTM Principles and Standards for School Mathematics
http://www.nctm.org

Technology Foundation Standards for All Students
http://www.iste.org/inhouse/nets/cnets/students/index.html
Technology Foundation Standards for All Teachers

US Dept of Education – No Child Left Behind
http://www.ed.gov

National Library of Virtual Manipulatives
http://nlvm.usu.edu/

Edutopia: The George Lucas Educational Foundation
http://www.edutopia.org/

Webquests
http://webquest.org/index.php

**Evaluation Procedures**

**Biography Post (to Forum)**

This assignment is essential for establishing our online class community. You will need to post it by the end of the first week of class. Engagement is necessary in all weeks of class through the final week. See the first announcement for additional information on this assignment.

There will also be questions to answer in the Bio/Introductory forum posting that is mandatory for the first week. It is recommended that references be given at the end of initial response posts after this first forum.

You will write a 250-word biography that introduces you to your classmates and to me. Please include your location, current career, and hobbies. Also provide a background on your former education/degrees/certifications. Define your professional goals and expectations for this course. If you have any gifted education experiences, please include them. This post will be verified by an automated computer run including a word count.

**Forum Participation**

Interaction between learners is a critical part of any course. Being connected to and within the classroom community allows us to motivate and support each other. Interaction, such as engaging in friendly discourse, sharing relevant experiences, and establishing collegial connections, are all integral parts of the online learning process and set the stage for student success.

The DB (forum) allows students to self-reflect on topics, perform critical thinking, and discuss how theory can be put into practice. Topics and questions will be posted to the DB each week and you and your classmates will be asked to respond to the postings. Your first, initial, response to the posting is intended to provide you with an opportunity to practice the skills discussed above as well as provide an opportunity to synthesize and analyze the topic at hand. The second requirement of the DB assignment is for you to respond to at least two of your classmates’ postings. These responses should be thoughtful and meaningful. It is very important to practice...
good Netiquette while in the DB, and any time on line. Please be respectful and, if you disagree with what has been posted, discuss the issue civilly, intelligently, and politely. Review of this Netiquette link will be of assistance in your posts:  
http://www.albion.com/netiquette/corerules.html

Your postings will be reviewed for critical thinking and thoughtful questioning. You are expected to cite references (APA format) to support your responses.

Classes will typically begin with a question I have posed the previous week. We should work to achieve conversational exchanges with each other through Forums and emails, constructively challenging each other to think broadly and critically about ideas or assertions posed by the readings.

**Mathematical Content Practice** (One in each Lesson) Throughout the semester students will complete content practice for each of the following areas: teaching and learning, theoretical approaches, number systems, number theory, problem solving, statistical analysis, and measurement.

**Mathematics Observation** (Lesson Two)  
Your mathematics observation will be conducted in your placement (2 Hours—)

**NOTE: Observations are not mandatory.** If observation is not feasible for the student, students may register at learner.org and may view 30 minute video segments instead of 1 hour of observation. Write a summary of what you observed and reflect on what you learned about teaching and learning from the video segment. This would mean watching 10 video segments on learner.org instead of 10 hours in the classroom. The videos are made in actual classrooms.

Please observe math instruction in your placement on three separate occasions. You should include in your reflection notes on the following aspects of mathematics instruction:

- Instructional Strategies
- Communication (teacher/student, student/student)
- Procedural versus Conceptual Content
- Student’s attitudes and understandings
- Managing large groups working on mathematics
- Time periods
- You individual reflections on what you are seeing

**Individual Student Interviews** You will work one on one with 4 separate students on four different student interviews in your classroom placement in order to complete this assignment (9 Hours)

**Interview One** (Lesson Three):  
Your assignment is to interview a student in order to understand their depth of mathematical thinking in relations to numbers. You need to decide what you are looking at, develop questions, interview a student and write a synthesized analysis
of what you learned. Please include the depth of the concept you are exploring and assess where that student falls in understanding. Please include the following to be turned in:

1. A listing of the interview tasks and materials used.
   - Problems or sequencing used
   - A description of what the child did (how he/she used manipulative, pictures, or other tools) and work samples.
   - Identification of the strategy used.
   - Any assistance that you provided to support the child in his/her problem solving.

3. A description stating what you learned about the child's mathematics thinking. Include any difficulties the child might have. Support your statements with evidence.


5. Describe the interview process. Is there anything you might do differently next time? What would you do next to help this child progress in his/her mathematical understanding?

**Interview Two (Lesson Four):**

Your assignment is to create a sequence of how you believe numeration understanding makes sense for you (make sure and include a description of place value and its importance in numeration). Imagine that you are a first-grade teacher. You want to begin instruction to help the children understand place value. How might you assess what the children already know? What would you include in assessment? Draw on our previous discussion of problem solving. What is the balance between discovery learning and understanding and the “telling” of our number system rules? Within the school interview a student (based on your last interview but with MORE depth) in order to increase your understanding of their depth of mathematical thinking in relations to the numbers. Based on your created sequence of how you believe numeration makes sense to you—try to assess your student and create a synthesized description of where they stand that clearly states your own opinion when it comes to numeration. Include the following:

1. A listing of the interview tasks and materials used.
   - Problems or sequencing used
   - A description of what the child did (how he/she used manipulative, pictures, or other tools) and work samples.
   - Identification of the strategy used.
   - Any assistance that you provided to support the child in his/her problem solving.

3. A description stating what you learned about the child's mathematics thinking. Include any difficulties the child might have. Support your statements with evidence.

5. Describe the interview process. Is there anything you might do differently next time? What would you do next to help this child progress in his/her mathematical understanding?

Interview Three (Lesson Five):

• Your assignment is to create a sequence of how you believe whole number operations would be best presented and explained to students. After you have written out your sequence, please reference the national and state standards and make comparisons to required CSO’s and your own thoughts. Please include a paragraph comparing and contrasting your work with the national and state standards.

• Interview a child to assess his or her understanding of operations. Describe the problems you asked the child to solve and the strategies he or she used to solve the problems. Describe what the child seemed to understand and what understanding the child still needs to develop. Please include a description of the child’s problem solving abilities in comparison to an understanding of algorithms.

Please Include the Following:

1. A listing of the interview tasks and materials used.

   • Problems or sequencing used
   • A description of what the child did (how he/she used manipulative, pictures, or other tools) and work samples.
   • Identification of the strategy used.
   • Any assistance that you provided to support the child in his/her problem solving.

3. A description stating what you learned about the child's mathematics thinking. Include any difficulties the child might have. Support your statements with evidence.


5. Describe the interview process. Is there anything you might do differently next time? What would you do next to help this child progress in his/her mathematical understanding?

Interview Four (Lesson Seven):

Please Include the Following:

• Create a sequence of learning that shows the depth of mathematical thinking according to your own experiences as a student, the class activity, discussions, and readings. You should then create a lesson plan/assessment instrument that would allow you to understand a student’s thinking in regards to estimation and/or measurement (you can decide your own focus). You should then conduct an interview with a student and write up an assessment of what you believe the students should/needs
to know based on your sequence and your beliefs about what they understand based on your interview. Please include examples of student work.

1. A listing of the interview tasks and materials used.
   - Problems or sequencing used
   - A description of what the child did (how he/she used manipulative, pictures, or other tools) and work samples.
   - Identification of the strategy used.
   - Any assistance that you provided to support the child in his/her problem solving.

3. A description stating what you learned about the child's mathematics thinking. Include any difficulties the child might have. Support your statements with evidence.


5. Describe the interview process. Is there anything you might do differently next time? What would you do next to help this child progress in his/her mathematical understanding?

**Web Quest (Lesson Six)**

You will be creating a math based WebQuest for use in the Elementary classroom setting. The focus of the assignment is to create high level, application problems for students using technological tools.

**Lesson Plan**

The lesson plans will be taught or created for your classroom placement (1 hours to be placed in your eportfolio)

They are:

1) A lesson that addresses whole number operations at the appropriate grade level (Lesson Five)

**Final - Project Based Math Unit**

- Create a PBL idea that is written out in summary format. The summary should include the following:
  - Two weeks of instruction
  - Clear thematic idea
  - Assessment
  - Math standards or principles
  - Math approaches in a problem solving, depth, critical thinking approach. Don’t just make a PBL that is actually
procedural in nature—leading the students through complex ideas—outline the sequence of thinking/reasoning necessary by the students and post—comment on two classmates posts in regards to the mathematical content

**Forum Participation** The Forum will be employed as a forum for discussing issues of interest to the class through the web. Students are required to post their biography in the Forum (week 1) and participate each week in a Forum thread (weeks 2 – 16). Also, appropriate “NETIQUETTE” should be followed for all postings.

<table>
<thead>
<tr>
<th>Grade Instruments</th>
<th>Points</th>
<th>Grading Tool</th>
<th>% of Final Grade</th>
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<tbody>
<tr>
<td>Content Practice ASSIGNMENTS</td>
<td>900</td>
<td>Review of Work</td>
<td>20%</td>
</tr>
<tr>
<td>Lesson Plans –Division Lesson Plan –Number System Problem</td>
<td>200</td>
<td>Rubric (APUS Writing Rubric: see below)</td>
<td>7%</td>
</tr>
<tr>
<td>Student Interview 1st</td>
<td>100</td>
<td>Rubric (APUS Writing Rubric: see below)</td>
<td>16%</td>
</tr>
<tr>
<td>Student Interview 2nd</td>
<td>100</td>
<td>Rubric (APUS Writing Rubric: see below)</td>
<td>16%</td>
</tr>
<tr>
<td>Forum participation</td>
<td>1400</td>
<td>Rubric (APUS Forum see below)</td>
<td>15.73%</td>
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<tr>
<td>Video Summary/Gretchen</td>
<td>100</td>
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<td>1.27%</td>
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<tr>
<td>WebQuest</td>
<td>100</td>
<td>Rubric (Technology Rubric: see below)</td>
<td>12%</td>
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<tr>
<td>Problem Based Learning Unit (PBL)</td>
<td>100</td>
<td>Rubric (APUS Writing Rubric: see below)</td>
<td>12%</td>
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<tr>
<td>Total Points</td>
<td>3000</td>
<td></td>
<td>100%</td>
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</table>

**NOTE: Observations are not mandatory.** If observation is not feasible for the student, students may register at learner.org and may view 30 minute video segments instead of 1 hour of observation. Write a summary of what you observed and reflect on what you learned about teaching and learning from the video segment. This would mean watching 10 video segments on learner.org instead of 10 hours in the classroom. The videos are made in actual classrooms.

In all participation and assignments I am looking for evidence of:
- demonstration of substantial knowledge and higher order thinking and analytic skills and application of facts, concepts, terms, and processes learned/read/discussed;
- critical contemplation, i.e., "grapple" with issues and topics;
- appropriate use of knowledge learned;
- imaginative thinking and responses to challenges/problems/issues;
- exploring underlying assumptions about the lifelong value of education and schooling;
- clarity of expression and logical connection among ideas expressed;
- writing that reflects precise and concise thinking;
- excellent grammar, syntax, and spelling.

**RUBRICS**

**M.Ed. Forum Rubric**

<table>
<thead>
<tr>
<th>APUS Assignment Rubric Graduate Level</th>
<th>EXEMPLARY LEVEL 4</th>
<th>ACCOMPLISHED LEVEL 3</th>
<th>DEVELOPING LEVEL 2</th>
<th>BEGINNING LEVEL 1</th>
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</thead>
<tbody>
<tr>
<td>SYNTHESIS OF KNOWLEDGE (FOCUS/THESIS)</td>
<td>Student exhibits a defined and clear understanding of the discussion questions. Response is clearly defined and well constructed to help guide the reader throughout the assignment. Student builds upon the thesis of the assignment with well-documented and exceptional supporting facts, figures, and/or statements. In establishing a good comprehension of topic and in the building of the thesis. Student demonstrates an effective presentation of thesis, with most support statements helping to strengthen the key focus of assignment.</td>
<td>Establishes a basic understanding of the intended assignment, but the thesis is not fully supported throughout the assignment. While thesis helps to guide the development of the assignment, the reader may have some difficulty in seeing linkages between thoughts. While student has included a few supporting facts and statements, this has limited impact on the development of the key themes.</td>
<td>Exhibits a limited understanding of the assignment. Reader is unable to follow the logic used for the thesis and development of key themes. Introduction of thesis is not clearly evident, and reader must look deeper to discover the focus of the writer. Student’s writing is weak in the inclusion of supporting facts, figures, and/or statements.</td>
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</table>
**FOUNDATION OF KNOWLEDGE**

<table>
<thead>
<tr>
<th>Student demonstrates proficient command of the subject matter in the discussion.</th>
<th>Student exhibits above average usage of subject matter in discussion.</th>
<th>The discussion reveals that the student has a general, fundamental understanding of the course material. Whereas, there are areas of some concern in the linkages provided between facts and supporting statements. Student generally explains concepts, but only meets the minimum requirements in this area.</th>
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<tbody>
<tr>
<td>Post shows an impressive level of depth of student’s ability to relate course content to practical examples and applications. Student provides comprehensive analysis of details, facts, and concepts in a logical sequence.</td>
<td>Student provides above average ability to relate course content to examples given. Details and facts presented provide an adequate presentation of student’s current level of subject matter knowledge.</td>
<td>Student tries to explain some concepts, but overlooks critical details. Assignment appears vague or incomplete in various segments. Student presents concepts in isolation, and does not perceive to have a logical sequencing of ideas.</td>
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</table>

**APPLICATION OF KNOWLEDGE (CRITICAL THINKING SKILLS)**

<table>
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<tr>
<th>Student demonstrates a higher-level of critical thinking necessary for graduate level work. Learner provides a strategic approach in presenting examples of problem solving or critical thinking, while drawing logical conclusions.</th>
<th>Student exhibits a good command of critical thinking skills in the presentation of material and supporting statements. Discussion demonstrates the student’s above average use of relating concepts by using a variety of factors.</th>
<th>Student takes a common, conventional approach in guiding the reader through various linkages and connections presented in assignment. However, student presents a limited perspective on key concepts throughout</th>
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<td>Student demonstrates beginning understanding of key concepts, but overlooks critical details. Learner is unable to apply information in a problem-solving fashion. Student presents</td>
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<td>CONCLUSIONS</td>
<td>RESEARCH SKILL</td>
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<td>conclusions which are not immediately obvious. Student provides well-supported ideas and reflection with a variety of current and/or world views in the assignment. Student presents a genuine intellectual development of ideas throughout assignment.</td>
<td>Student achieves an above average synthesis of research, but interpretation is narrow in scope and description within assignment.</td>
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<td>assignment. Student appears to have problems applying information in a problem-solving manner.</td>
<td>Assignment provides a basic, but borderline perspective of student’s research abilities.</td>
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<tr>
<td>confusing statements and facts in assignment. No evidence or little semblance of critical thinking skills.</td>
<td>Student fails to provide an adequate synthesis of research collected for assignment. The lack of appropriate references or source materials demonstrates the student’s need for additional help or training in this area. The discussion post is not of acceptable quality for graduate-level work.</td>
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Rubric concept borrowed from APUS Writing Rubric: [http://www.apus.edu/Learning-Outcomes-Assessment/Initiatives/Rubrics-Program/Rubrics-Graduate.html](http://www.apus.edu/Learning-Outcomes-Assessment/Initiatives/Rubrics-Program/Rubrics-Graduate.html)
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<tr>
<th><strong>APUS Assignment Rubric Graduate Level</strong></th>
<th><strong>EXEMPLARY LEVEL 4</strong></th>
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<tr>
<td><strong>SYNTHESIS OF KNOWLEDGE (FOCUS/THEESIS) [Graduate Learning Outcomes Assessment Objective #4]</strong></td>
<td>Student exhibits a defined and clear understanding of the assignment. Thesis is clearly defined and well constructed to help guide the reader throughout the assignment. Student builds upon the thesis of the assignment with well-documented and exceptional supporting facts, figures, and/or statements. Establishes a good comprehension of topic and in the building of the thesis. Student demonstrates an effective presentation of thesis, with most support statements helping to support the key focus of assignment.</td>
<td>Student exhibits a basic understanding of the intended assignment, but the thesis is not fully supported throughout the assignment. While thesis helps to guide the development of the assignment, the reader may have some difficulty in seeing linkages between thoughts. While student has included a few supporting facts and statements, this has limited the quality of the assignment.</td>
<td>Exhibits a limited understanding of the assignment. Reader is unable to follow the logic used for the thesis and development of key themes. Introduction of thesis is not clearly evident, and reader must look deeper to discover the focus of the writer. Student’s writing is weak in the inclusion of supporting facts or statements.</td>
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<td><strong>FOUNDATIO N OF KNOWLEDGE [Graduate Learning Outcomes Assessment Objective #3]</strong></td>
<td>Student demonstrates proficient command of the subject matter in the assignment. Assignment shows an impressive level of depth of student’s ability to relate course content to practical examples and applications. Student provides comprehensive analysis of details, facts, and concepts in a logical sequence. Student exhibits above average usage of subject matter in assignment. Student provides above average ability in relating course content in examples given. Details and facts presented provide an adequate presentation of student’s current level of subject matter knowledge. The assignment reveals that the student has a general, fundamental understanding of the course material. Whereas, there are areas of some concern in the linkages provided between facts and supporting statements. Student generally explains concepts, but only meets the minimum requirements in this area.</td>
<td>Student tries to explain some concepts, but overlooks critical details. Assignment appears vague or incomplete in various segments. Student presents concepts in isolation, and does not perceive to have a logical sequencing of ideas.</td>
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<td><strong>APPLICATION OF KNOWLEDGE (CRITICAL THINKING SKILLS) [Graduate Learning Outcomes Assessment Objective #5]</strong></td>
<td>Student demonstrates a higher-level of critical thinking necessary for graduate level work. Learner provides a strategic approach in presenting examples of problem solving or critical thinking, while drawing logical conclusions which are not immediately obvious. Student provides well-supported ideas and reflection with a variety of current and/or world views in the assignment. Student presents a genuine intellectual development of ideas throughout assignment.</td>
<td>Student exhibits a good command of critical thinking skills in the presentation of material and supporting statements. Assignment demonstrates the student's above average use of relating concepts by using a variety of factors. Overall, student provides adequate conclusions, with 2 or fewer errors.</td>
<td>Student takes a common, conventional approach in guiding the reader through various linkages and connections presented in assignment. However, student presents a limited perspective on key concepts throughout assignment. Student appears to have problems applying information in a problem-solving manner.</td>
<td>Student demonstrates beginning understanding of key concepts, but overlooks critical details. Learner is unable to apply information in a problem-solving fashion. Student presents confusing statements and facts in assignment. No evidence or little semblance of critical thinking skills.</td>
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<td><strong>ORGANIZATION OF IDEAS/FORMAT</strong></td>
<td>Student thoroughly understands and excels in explaining all major points. An original, unique, and/or imaginative approach to overall ideas, concepts, and findings is presented. Overall format of assignment includes an appropriate introduction (or abstract), well-developed paragraphs, and conclusion. Finished assignment demonstrates student's ability to plan and organize research in a logical sequence.</td>
<td>Student explains the majority of points and concepts in the assignment. Learner demonstrates a good skill level in formatting and organizing material in assignment. Student presents an above average level of preparedness, with few formatting errors.</td>
<td>Learner applies some points and concepts incorrectly. Student uses a variety of formatting styles, with some inconsistencies throughout the paper. Assignment does not have a continuous pattern of logical sequencing.</td>
<td>Assignment reveals formatting errors and a lack of organization. Student presents an incomplete attempt to provide linkages or explanation of key terms.</td>
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<td><strong>APUS Assignment Rubric Graduate Level</strong></td>
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<td><strong>WRITING SKILL [Graduate Learning Outcomes Assessment Objective #2]</strong></td>
<td>Student demonstrates an excellent command of grammar, as well as presents research in a clear and concise writing style. Student excels in the selection and development of a well-planned research assignment. Assignment is error-free and reflects student’s ability to prepare graduate-level writing for possible publication in a peer-reviewed (refereed) journal.</td>
<td>Student provides an effective display of good writing and grammar. Assignment reflects student’s ability to select appropriate word usage and presents an above-average presentation of a given topic or issue. Assignment appears to be well written with no more than 3-5 errors. Student provides a good final product that covers the above-minimal requirements.</td>
<td>Assignment reflects basic writing and grammar, but with more than 5 errors. Key terms and concepts are somewhat vague and not completely explained by student. Student uses a basic vocabulary in assignment. Student’s writing ability is average, but demonstrates a basic understanding of the subject matter.</td>
<td>Topics, concepts, and ideas are not coherently discussed or expressed in assignments. Student’s writing style is weak and needs improvement, along with numerous proofreading errors. Assignment lacks clarity, consistency, and correctness. Student needs to review and revise assignment.</td>
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<tr>
<td><strong>USE OF COMPUTER TECHNOLOGY/APPLICATIONS</strong></td>
<td>Student provides a high-caliber, formatted assignment. Learner exhibits excellent use of computer technology in the development of assignment. Quality and appropriateness of stated references demonstrate the student’s ability to use technology to conduct applicable research. Given assignment includes appropriate word processing, spreadsheet and/or other computer applications as part of the final product.</td>
<td>Assignment presents an above-average use of formatting skills, with less than 3 errors. Students has a good command of computer applications to format information and/or figures in an appropriate format. Student uses at least two types of computer applications to produce a quality assignment.</td>
<td>Student demonstrates a basic knowledge of computer applications. Appearance of final assignment demonstrates the student’s limited ability to format and present data. Resources used in assignment are limited. Student may need to obtain further help in the use of computer applications and Internet research.</td>
<td>Student needs to develop better formatting skills. The student may need to take additional training or obtain help from the Educator Help Desk while preparing an assignment. Research and resources presented in the assignment are limited. Student needs to expand research scope. The number of formatting errors is not acceptable.</td>
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<tr>
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<td><strong>RESEARCH SKILL</strong> [Graduate Learning Outcomes Assessment Objective #1]</td>
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<td>Student provides sophisticated synthesis of complex body of information in the preparation of assignment. Research provided by student contributes significantly to the development of the overall thesis. Student incorporates at least of 7-10 quality references in assignment. Student incorporates a variety of research resources and methodology in the preparation of assignment.</td>
<td>Student achieves an above average synthesis of research, but interpretation is narrow in scope and description within assignment. Assignment contains less than 7 resources, and presents an average overview of key concepts.</td>
<td>Assignment provides a basic, but borderline perspective of student’s research abilities. Student has incorporated less than 4 sources, which does not attempt to cover key elements of assignment.</td>
<td>Student fails to provide an adequate synthesis of research collected for assignment. The lack of appropriate references or source materials demonstrates the student’s need for additional help or training in this area. Student needs to review and revise the assignment. The paper is not of acceptable quality for graduate-level work.</td>
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<td><strong>TOTAL POINTS</strong></td>
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**Course Outline**

**8 Week Course**

<table>
<thead>
<tr>
<th>MODULE</th>
<th>Topic(s)</th>
<th>Learning Objective(s)</th>
<th>Reading(s)</th>
<th>Assignment(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning and Teaching Mathematics</td>
<td>Explore an understanding of different modes of representation in the discipline of mathematics</td>
<td>Cathcart Chapter 1 &amp; 2, Review the NCTM Math Standards</td>
<td>Content Assignment Lesson One (weeks 1 &amp; 2) Discussion Postings On Page 20 in Chapter 2 is a description of the five modes of representation in mathematics: real-world situations, manipulative models, pictures, oral language, and written symbols. When students can represent a concept in more than one mode, it indicates...</td>
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<tr>
<td>Mathematical Concept</td>
<td>Reflect on the teaching of mathematics</td>
<td>Contextualize broad ideas about elementary math curriculum</td>
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<td>better understanding. For today’s discussion, we are talking in general terms—so, you can choose any mathematical concept and represent it in the five different modes. Please include questions/prompts that could be used when working with a child with this activity.</td>
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<td>Using your thoughts from the question posed in the third section—please explains how the example you made does/does not fit with your feelings on how math should be taught.</td>
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<thead>
<tr>
<th>Content Assignment Lesson Two (weeks 3 &amp; 4)</th>
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<tbody>
<tr>
<td>Discussion Postings</td>
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<tr>
<td>Please complete the following problems. For each problem write the following:</td>
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<tr>
<td>o Understanding of what the problem is asking</td>
</tr>
<tr>
<td>o Plan to solve the problem</td>
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<tr>
<td>o Implementation of the plan</td>
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<tr>
<td>o Reflection on the problem</td>
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| Problem 1: Rock Star Pictures |
| Shane gave one-half of his rock star pictures to Samantha, then gave 6 pictures to Darryl and had 12 left. How many rock star pictures did Shane have before he gave any away? |

| Problem 2: The Class Reunion |
| Twelve people came to celebrate their 10 year high school reunion. Each person shook hands once with all the other people. How many handshakes were exchanged at the reunion? |

| Problem #3: The Outfit |
| Josh has 3 pairs of pants, 4 sweaters, and 2 pairs of shoes. How many different pant-sweater-shoes combinations can Josh choose from to wear to school on Monday? |
| o |
| 3 | Developing Number Concepts | Explore a personal understanding of number concepts  
Understand number concepts for elementary students  
Make a connection between the preservice teachers' number concepts and how that relates to assessing elementary students mathematical thinking | Cathcart Chapter 5 | Content Assignment Lesson Three (weeks 5 & 6)  
Discussion Postings  
Module 3 Interview: Your assignment is to interview a student in order to understand their depth of mathematical thinking in relations to numbers. You need to decide what you are looking at, develop questions, interview two students and write a synthesized analysis of what you learned.  
Please include the depth of the concept you are exploring and assess where that student falls in understanding.  
1. A list of the interview tasks and materials used.  
   - Problems or sequencing used  
   - A description of what the child did (how he/she used manipulative, pictures, or other tools) and work samples.  
   - Identification of the strategy used.  
   - Any assistance that you provided to support the child in his/her problem solving.  
2. A description stating what you learned about the child's mathematics thinking. Include any difficulties the child might have. Support your statements with evidence.  
3. A description of your own mathematical learning.  
4. Describe the interview process. Is there anything you might do differently next time? What would you do next to help this child progress in his/her mathematical understanding? |
| 4 | Developing Understanding of Numeration | Explore a personal understanding of number theory  
Understand number theory concepts for elementary students | Cathcart Chapter 6 | Content Assignment Lesson Four (weeks 7 & 8)  
Discussion Postings  
Numeration Understanding: Your assignment is to create a sequence of how you believe numeration |
<table>
<thead>
<tr>
<th>5</th>
<th>Developing Whole-Number Operations: Addition, Subtraction, Multiplication, and Division</th>
<th>Make a connection between the preservice teachers understanding of numeration and how that relates to teaching elementary students</th>
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<tbody>
<tr>
<td>Understand modeling word problems for addition and subtraction</td>
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<tr>
<td>Understanding Addition and Subtraction</td>
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<tr>
<td>Explore the use of appropriate instructional technology within the classroom</td>
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<tr>
<td>Understand modeling word problems for Multiplication and Division</td>
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<tr>
<td>Understanding Multiplication and Division</td>
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<tr>
<td>Content Assignment Lesson Five (weeks 9 &amp; 10)</td>
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<tr>
<td>Discussion Postings</td>
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<tr>
<td>Assignment 1: Your assignment is to create a sequence of how you believe whole number operations would be best presented and explained to students. After you have written out your sequence, please reference the national and state standards and make comparisons to required CSO’s and your own thoughts. Please include a paragraph comparing and contrasting your work with the national and state standards.</td>
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<td>Assignment 2: Please choose from the following options and write a lesson plan that integrates technology into the teaching of whole number operations.</td>
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<td>- Write a lesson plan to help introduce children to the Join type of addition problems</td>
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<td>- Write a lesson plan to help introduce children to the Equal Groups type of multiplication and division problems</td>
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<td>- Write a lesson plan to help children understand division by zero</td>
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| 6 | Webquests | Webquest (Weeks 11 & 12) |
| 7 | Estimating and Measurement | Observe, experience, and evaluate other web quest for mathematical integrity, and technology effectiveness. Apply higher level mathematical thinking utilizing instructional technology. Explore the use of appropriate instructional technology within the classroom. | Discussion Postings  
Complete an internet search for a webquest topic that matches class content. Complete the webquest as if you were a student. When you have completed a the webquest, please post to the discussion board. Please comment on the mathematical content and assessment of the webquest. Is the math at a higher level, problem solving? Does the assessment focus on the math or on the technology? |
| 8 | Algebra | Explore different algebraic representations. | Discussion Postings (weeks 13 and 14)  
Content Activity Lesson 7  
Please open the following document and complete the tasks required: Candy Activity. Please collect several flat, circular objects that you can measure, a piece of string, and a ruler.  
- You will be measuring each of the objects. Follow the directions for recording your findings under the Instructional Plan section of The Ration of Circumference to Diameter lesson.  
- After you complete the required activities as though you were a student in a public school math classroom turn in the Apple Pi Recording Chart. |

Cathcart Chapter 9  
Cathcart Chapter 17
Understanding functions
Develop connections between elementary mathematics as a foundation for algebraic concepts

- Collect the following material for the algebra activity: M&M's, a balloon, and paper cups.
- Click Determining Functions Using Regression and complete the instructional steps listed for activity 1-5.

PBL
Create a PBL idea that is written out in summary format. The summary should include the following:
- Two weeks of instruction
- Clear thematic idea
- Assessment
- Math standards or principles
- Math approaches in a problem solving, depth, critical thinking approach. Don’t just make a PBL that is actually procedural in nature—leading the students through complex ideas—outline the sequence of thinking/reasoning necessary by the students and post—comment on two classmates posts in regards to the mathematical content

Policies

ACADEMIC DISHONESTY: PLAGIARISM AND CHEATING
The University System supports and promotes academic honesty and personal integrity. Cheating can take the following forms:
- Submitting another person's work
- Writing a paper for someone else
- Working in a group effort without faculty consent
- Buying a paper from a research service
- Getting outside help or giving outside help without a teacher’s expressed permission
- Submitting the same work for credit without approval (e.g. submitting the same assignment twice for different courses)

The Web & Plagiarism Note: The Web has made it quite easy to copy and insert materials into a paper. Students must be careful to properly attribute materials found on the Web. In a collegiate setting, attribution typically relies on a formal academic style manual for its citation models (See Citation and Reference Style). Such models describe how to append footnotes and endnotes, when:
- Quoting another’s exact words, you are obviously expected to name the author and place the words in quotation marks or in indented text blocks. The citation number is placed immediately at the end of the quotation.
• Acknowledging background sources to your own descriptions--. The citation number is normally placed at the end of the paragraph.

Note: The University offers tools in its Online Library Research Center to help you analyze your papers for possible plagiarism violations and for instructors to uncover such activities.

WRITING EXPECTATIONS
All written submissions should be submitted in a font and page set-up that is readable and neat. It is recommended that students try to adhere to a consistent format, which is described below.

• Typewritten in double-spaced format with a readable style and font and submitted inside the electronic classroom (unless classroom access is not possible and other arrangements have been approved by the professor).
• Arial 11 or 12-point font or Times New Roman styles.
• Page margins Top, Bottom, Left Side and Right Side = 1 inch, with reasonable accommodation being made for special situations and online submission variances.

CITATION AND REFERENCE STYLE
Assignments completed in a narrative essay or composition format must follow APA guidelines. This course will require students to use the citation and reference style established by the American Psychological Association (APA), in which case students should follow the guidelines set forth in Publication Manual of the American Psychological Association (5th ed.). (2001). Washington, D.C.: American Psychological Association.

COURSE EXTENSIONS
Students must determine the need for their first Course Extension and submit their "Request Course Extension" form before the end of the grading period (14 days after the end date of the course). Courses may be extended in 30-day intervals for a maximum of 90 days. If the request form is unavailable and the student is within the extension request period the student may email the professor and carbon copy (cc) registrar@apus.edu to request an extension.

Students who will be prevented from participating in a course due to extenuating circumstances may be eligible for a Deployment and/or Special Circumstance extension.

LATE ASSIGNMENTS
Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. As adults, students, and working professionals I understand you must manage competing demands on your time. Should you need additional time to complete an assignment please contact me before the due date so we can discuss the situation and determine an acceptable resolution. Routine submission of late assignments is unacceptable and may result in points deducted from your final course grade.

DISABILITY ACCOMMODATIONS
This institution complies with the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and state and local requirements regarding students with disabilities. In compliance with federal and state regulations, reasonable accommodations are provided to qualified students with disabilities.

A request for accommodation is deemed reasonable if the request:

• is based on documented individual needs.
• does not compromise essential requirements of a course or program.
• does not impose an undue financial or administrative burden upon APUS.

A qualified student can, with or without reasonable accommodations, perform the essential functions of program or course requirements. The essential requirements of an academic course or program need not be modified to accommodate an individual with a disability.
Final responsibility for selection of the most appropriate accommodation rests with the University's Disability Support Services Committee and is determined on an individual case-by-case basis, based on the nature of the student's disability. Students are encouraged email registrar@apus.edu to discuss potential academic accommodations and begin the review process. It is the student's responsibility to:

- follow the accommodation procedure outlined in this section
- identify the disability to the staff and/or faculty of the university
- provide (and incur expense for) current appropriate documentation of disability and accommodation needed from a qualified medical or other licensed professional.
- request specific accommodations or services

NETIQUETTE
Online universities promote the advance of knowledge through positive and constructive debate—both inside and outside the classroom. Discussions on the Internet, however, can occasionally degenerate into needless insults and “flaming.” Such activity and the loss of good manners are not acceptable in a university setting—basic academic rules of good behavior and proper “Netiquette” must persist. Remember that you are in a place for the fun and excitement of learning that does not include descent to personal attacks, or student attempts to stifle the discussion of others.

- **Technology Limitations:** While you should feel free to explore the full-range of creative composition in your formal papers, keep e-mail layouts simple. The Educator classroom may not fully support MIME or HTML encoded messages, which means that bold face, italics, underlining, and a variety of color-coding or other visual effects will not translate in your e-mail messages.
- **Humor Note:** Despite the best of intentions, jokes and—especially—satire can easily get lost or taken seriously. If you feel the need for humor, you may wish to add “emoticons” to help alert your readers: ;-), ;), 😊

DISCLAIMER STATEMENT
Course content may vary from the outline to meet the needs of this particular group.

**Academic Services**

**ONLINE LIBRARY RESEARCH CENTER & LEARNING RESOURCES**
The Online Library Resource Center is available to enrolled students and faculty from inside the electronic campus. This is your starting point for access to online books, subscription periodicals, and Web resources that are designed to support your classes and generally not available through search engines on the open Web. In addition, the Center provides access to special learning resources, which the University has contracted to assist with your studies. Questions can be directed to orc@apus.edu.

- **Charles Town Library and Inter Library Loan:** The University maintains a special library with a limited number of supporting volumes, collection of our professors' publication, and services to search and borrow research books and articles from other libraries.
- **Electronic Books:** You can use the online library to uncover and download over 50,000 titles, which have been scanned and made available in electronic format.
- **Electronic Journals:** The University provides access to over 12,000 journals, which are available in electronic form and only through limited subscription services.
- **Turnitin.com:** Turnitin.com is a tool to improve student research skills that also detect plagiarism. Turnitin.com provides resources on developing topics and assignments that encourage and guide students in producing papers that are intellectually honest, original in thought, and clear in expression. This tool helps ensure a culture of adherence to the University's standards for intellectual honesty. Turnitin.com also reviews students' papers for matches with Internet materials and with thousands of student papers in its database, and returns an Originality Report to instructors and/or students.
• **Smarthinking**: Students have access to 10 free hours of tutoring service per year through Smarthinking. Tutoring is available in the following subjects: math (basic math through advanced calculus), science (biology, chemistry, and physics), accounting, statistics, economics, Spanish, writing, grammar, and more. Additional information is located in the Online Research Center. From the ORC home page, click on either the “Writing Center” or “Tutoring Center” and then click “Smarthinking.” All login information is available.