**DEPARTMENT OF TEACHER EDUCATION & ADMINISTRATION**

**COLLEGE OF EDUCATION UNIVERSITY OF NORTH TEXAS**

**EDEE 4350: Math in Elementary Grades EC-8**

**Catalog Description**: Principles in mathematics teaching and learning based on national curriculum, assessment standards, and the learning process in the development of mathematical thinking and skills in children. Students observe mathematics instruction and materials in real settings and experience firsthand the scope and sequence of mathematics in a primary/elementary/middle school setting. Assignments, directed field experience and other class activities take place on site in a school setting.

**Prerequisite:** Admission to the teacher education program, which includes participation in a field-based program, EDEE 3320, 3380; all courses in the reading/English/language arts part of the academic major; required core and academic major math courses and DFEC classes.

**Course Goals:** This course is designed to develop reflective teaching practices in mathematics. The student will be exposed to a wide range of issues and theories in mathematics curriculum, and encouraged to relate these to his/her own teaching practices. Opportunities for teaching and observation of teaching will be provided in order to analyze and reflect on teaching practices in mathematics. The course encourages students to make meaningful connections between theory and practice through a variety of experiences.

**Learning Objectives:**

Through this course, students should:

1. Know current perspectives in elementary level mathematics curriculum.

2. Be able to reflect on the practices of teaching that have influenced them as well as the influences of their practices on students.

3. Be able to develop appropriate assessment techniques that inform instructional practice and support student learning.

4. Be able to effectively implement the elementary mathematics curriculum.

5. Know the various types of manipulatives and other concrete materials available for modeling and developing concepts in elementary mathematics.

6. Be able to apply a variety of calculator and computer applications appropriate for the elementary mathematics classroom.

7. Be able to apply a variety of teaching strategies for elementary school mathematics.

8. Be acquainted with mathematics in a broader cultural context.

**Required Text:**

van de Walle, J., Karp, K., & Bay-Williams, J. (2009). *Elementary and Middle School Mathematics: Teaching Developmentally Texas Edition* (7th ed.). Boston: Pearson Education, Inc.

**Course Requirements:**

**1. Attendance, Class Preparation, and Participation**

Participation in class discussions each week: you will be assessed on pertinence and depth of discussion contribution (questions, readings, experience, etc.). Reading assignments will be announced. Reading topics will be discussed in class, and graded with follow-up assignments. Points will be assigned each class meeting.

**2. In-Class Assignments/ Lab Notebook**

You will keep a notebook (composition book) to record and support your learning as a teacher of mathematics. You will use your notebook to record the work we do in class, including solving mathematics problems and analyzing the work of teaching. The notebook will be used to create a record of your own work and thinking as well as the class’ accumulated understandings, investigations, conjectures, arguments, and solutions.

Notebooks will be collected periodically after class. Segments will be read to assess how you are engaging in the assignments and class work. To receive full credit, records of in class work should demonstrate thoughtful and complete tasks and reflections.

**3. Lesson Plans**

It is essential to connect theory and practice within the teaching of grades EC-6 (same applies to EC-4 and 4-8) mathematics. Thus, you will be asked to assist in implementing, leading, and/or planning for activities and lessons within grade EC-6 classrooms for the classes you are assigned using standards-based resources, district curriculum, input from your mentor teacher, cadre coordinator and this course instructor.

In general, (a) curriculum source and a description of the content, instructional materials (manipulatives and various technologies), and activities used in the classes, (b) pre-assessment of student understanding, (c) development of lessons, (d) group or individual work, and (e) closure for lessons along with specific assessments will be implemented during the semester.

The lessons will include a detailed lesson plan (see format provided by the instructor), sample instructional materials, student work, and personal reflection. Instruction should reflect approaches supported by this course and use of multiple assessment tools is required (including a pretest/diagnostic and posttest achievement measure). Technology must be integrated in at least one lesson (excluding basic four-function calculator use).

**4. Professional Practice**

These activities will involve teaching opportunities in your field experience classroom. These activities are designed for you to try out and get feedback on the teaching strategies, practices, and skills we have developed in class. These teaching experiences will be followed up with a written reflection and class discussion. Activities include such activities as classroom observations, student thinking interviews, teaching or leading an activity and individual tutoring.

It is important for you to identify, collect, and organize instructional resources to support the teaching and learning of mathematics. An electronic resource file will be compiled. The organization structure will be discussed in class. Assessment will also include organization and appropriateness of materials for teaching mathematics.

**5. FINAL EXAM PRESENTATION**

This will connect to the required portfolio. Details will be given in class.

**Evaluation and Grading System:**

1. Attendance, Class Preparation, and Participation 12%

2. In Class Assignments/ Lab Notebook 15%

3. Lesson Plans 35%

4. Professional Practice 25%

5. Final Exam 13%

**A = 90-100% B = 80-89% C = 70-79% D = 60-69% F = 0-59%**

**Schedule:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Class Mtg.*  | *TExES PPR*  | *TEKS*  | *Topic*  | *Assignment (Reading, Papers, etc.)*  |
| 1   | D I: C003 A; D III: C007 C, D IV: C012 I  |   | Overview of course; syllabus & Teaching Elementary & Middle Level Mathematics *QuickDraw* Implementing the NCTM Standards & TEKS  | VdW: Chap 1 (in class)   |
| 2  | C I: C004 A,B  |   | *QuickDraw* Teaching Mathematics for Understanding Conceptual vs. Procedural  | VdW: Chap 2 Treasure Hunt Due  |
| 3  | D I: C003 A-F  |   | *QuickDraw* Instructional Planning/ Assessment Student Thinking/Problem Solving  |  VdW: Chap. 3 & 4   |
| 4  | D I: C002 B,D,G; C003 D,F; D III: C007 C  |   | *QuickDraw* Teaching Mathematics Equitably Connections in Mathematics History of Counting Math Quilts  |  VdW: Chap. 5 & 6  |
| 5  | D I: C003 E, C004 J: C II: C005 C,F; C006 A; D III: C009 F  |   | *QuickDraw* Data Analysis Technology  |  VdW: Chap 7 Observation Paper Due  |
| 6  | D III: C007 B  | K-3, NO, PR, GS, M, UP  | Early Number Concepts and Number Sense Whole Number Place-Value Concepts  | VdW: Chap. 8 & 11  |
| 7  | D I: C002 A,E,G; C003 A-F,H; C004 A,E-H,L,N: D II: C005 A-G; C006 B,C; D III: C007 A-C; C008 A-G; C010 A-C  | K-8, PR, GS, M, UP  | Geometry: Islamic Art & Geometric Design Project  |  VdW: Chap. 19 & 20 Problem-Based Lesson Plan Due  |
| 8  | D III: C007 B  | 1-4, NO, PR, GS, UP  | Meanings of Operations Basic Facts Patterns in Math (incl Songs)  |  VdW: Chap. 9 & 10   |
| 9  | D I: C002 A,E,G; C003 A-F,H  | 1-7, NO, UP  | Whole Number Computation Computational Estimation for Whole Numbers   |  VdW: Chap. 12 & 13 Geometry Lesson Due  |
| 10  | D IV: C012 I  | 2-7, NO, PR, GS,UP  | Fractions Fraction Computation   |  VdW: Chap. 15 & 16  |
| 11  | D III: C007  | 4-8, NO,  | Decimals & Percents  |  VdW: Chap 17 & 18  |

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| --- | --- | --- | --- | --- |
|  | A,D  | PR, GS,M, PS,UP  | Proportional Reasoning   |   |
| 12  | D I: C003 E, C004 J: C II: C005 C,F; C006 A; D III: C009 F  |   | Blackboard Assignment  |  Electronic Resource File Due  |
| 13  |   | K-8, GS, PS, UP  | Probability & Data Analysis  |  VdW: Chap. 21 & 22  |
| 14  | D I: C002 A,E,G; C003 A-F,H; C004 A,E-H,L,N: D II: C005 A-G; C006 B,C; D III: C007 A-C; C008 A-G; C010 A-C  |   | TBA  |  5E Lesson Plan Due  |
| 15  | D IV: C012 I  |   | PRE FINAL EXAMS  | Final Exam Presentation Due  |
|   | D IV: C012 I  |   | FINAL EXAM PRESENTATIONS  |   |

Texas Essential Knowledge and Skills (**TEKS**) Grades K-8: Number, operation, and quantitative reasoning (NO); Patterns, relationships, and algebraic thinking (PR); Geometry and spatial reasoning (GS); Measurement (M); Probability and statistics (PS); Underlying processes and mathematical tools (UM)

**Pedagogy and Professional Responsibility (PPR) Standards :**

 Knows and understands the importance of the state content and performance standards as outlined in the TEKS.

 Uses the TEKS to plan instruction.

 Knows and understands the importance of designing instruction that reflects the TEKS through Grade 6.

 Plans instructional activities that progress sequentially and support stated instructional goals based on the TEKS through Grade 6.

 Knows the connection between the statewide Texas assessment program, the TEKS through Grade 6, and instruction.

 Standard I: Domain I: Competency 001-004 Domain III: Competency 007-010: The teacher designs instruction appropriate for all students that reflects an understanding of relevant content and is based on continuous and appropriate assessment.

 Standard II: Domain II: Competency 005-006: The teacher creates a classroom environment of respect and rapport that fosters a positive climate for learning, equity and excellence.

 Standard III: Domain III: Competency 007-010: The teacher promotes student learning by providing responsive instruction that makes use of effective communication techniques, instructional strategies that actively engage students in the learning process and timely and high-quality feedback.

 Standard IV: Domain IV: Competency 011-013: The teacher fulfills professional roles and responsibilities and adheres to legal and ethical requirements of the profession.

 Technology Applications Standard I: Domain III: Competency 007-010: All teachers use technology-related terms, concepts, data input strategies and ethical practices to make informed decisions about current technologies and their applications.

 Technology Applications Standards II: Domain III: Competency 007-010: All teachers identify task requirements, apply search strategies and use current technology to efficiently acquire, analyze and evaluate a variety of electronic information.

 Technology Applications Standard III: Domain III: Competency 007-010: All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.

 Technology Applications Standard IV: Domain III: Competency 007-010: All teachers communicate information in different formats and for diverse audiences.

 Technology Applications Standard V: Domain III: Competency 007-010: All teachers know how to plan, organize, deliver and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills.

**TEKS Mathematics Standards:**

 Number Concepts: The mathematics Teacher understands and uses numbers, number systems and their structure, operations, and algorithms, quantitative reasoning, and technology appropriate to teacher the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

 Patterns and Algebra: The mathematics teacher understands and uses patterns, relations, functions, algebraic reasoning, analysis and technology appropriate to teach the statewide curriculum [TEKS] in order to prepare students to use mathematics.

 Geometry and Measurement: The mathematics teacher understands and uses geometry, spatial reasoning, measurement concepts and principles, and technology appropriate to teach the statewide curriculum [TEKS] in order to prepare students to use mathematics.

 Probability and Statistics: The mathematics teacher understands and uses probability and statistics, their applications, and technology appropriate to teach the statewide curriculum [TEKS] in order to prepare students to use mathematics.

 Mathematical Processes: The mathematics teacher understands and uses mathematical processes to reason mathematically, to solve mathematical problems, to make mathematical connections within and outside of mathematics, and to communicate mathematically.

 Mathematical Perspectives: The mathematics teacher understands the historical development of mathematical ideas, the interrelationship between society and mathematics, the structure of mathematics, and the evolving nature of mathematics and mathematical knowledge.

 Mathematical Learning and Instruction: The mathematics teacher understands how children learn and develop mathematical skills, procedures, and concepts, knows typical errors students make, and uses this knowledge to plan, organize, and implement instruction to meet curriculum goals; and to teach all students to understand and use mathematics

**Curriculum topics:**

 Code of Ethics per Chapter 247: Domain II, IV

 TEKS organization, structure, and skills: Domain I, III

 State assessment of students (STARR Responsibilities): Domain I, II, IV

 Curriculum development and lesson planning: Domain I, II, III

 Classroom assessment for instruction/diagnosing learning needs: Domain I, III

 Instructional technology: Domain I, III

 Pedagogy/Instructional strategies: Domain I, III, IV

 Differentiated instruction: Domain I, II, III, IV

 Classroom Management: Domain II, IV

**Teacher Education & Administration**

***Departmental Policy Statements***

*Disabilities Accommodation:* “The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.”

*Academic Integrity:* Students are encouraged to become familiar with UNT’s policy on academic integrity: <http://www.unt.edu/policy/UNT_Policy/volume3/18_1_16.pdf>. Academic dishonesty, in the form of plagiarism, cheating. or fabrication, will not be tolerated in this class. Any act of academic dishonesty will be reported, and a penalty determined, which may be probation, suspension, or expulsion from the university.

*Student Conduct:* Expectations for behavior in this class accord with the Code of Student Conduct: “Student behavior that interferes with an instructor’s ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Center for Student Rights and Responsibilities to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc.” See [www.unt.edu/csrr](http://www.unt.edu/csrr).

*Acceptable Student Behavior:* Student behavior that interferes with an instructor’s ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at [www.deanofstudents.unt.edu](http://www.deanofstudents.unt.edu).

*Attendance:* See instructor’s attendance policy.

*Eagle Connect*: All official correspondence between UNT and students is conducted via Eagle Connect and it is the student's responsibility to read their Eagle Connect Email regularly.

*Cell Phones and Laptop:* Students should turn off cell phones when they are in class unless the phones are being used for learning activities associated with the course.

*SETE:* The Student Evaluation of Teaching Effectiveness (SETE) is expected for all organized classes at UNT. This brief online survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class.

*Collection of Student Work*: In order to monitor students' achievement, improve instructional programs, and publish research findings, the Department of Teacher Education and Administration collects anonymous student work samples, student demographic information, test scores, and GPAs to be analyzed by internal and external reviewers.

*TK20*: Some undergraduate and graduate education courses require assignments that must be uploaded and assessed in the UNT TK20 Assessment System. This requires a one-time purchase of TK20, and student subscriptions are effective for seven years from the date of purchase. Please go to the following link for directions on how to purchase TK20: <http://www.coe.unt.edu/tk20>. Announcements regarding TK20 will also be posted on this website.

*Comprehensive Arts Program Policy.* The Elementary Education program area supports a comprehensive arts program to assist preservice and inservice teachers to design and implement curricular and instructional activities which infuse all areas of the arts (visual, music, theater, and movement) throughout the elementary and middle school curriculum.

*Technology Integration Policy.* The Elementary, Secondary, and Curriculum & Instruction program areas support technology integration to assist preservice and inservice teachers to design and implement curricular and instruction activities which infuse technology throughout the K-12 curriculum.

*TExES Test Preparation*. To meet state requirements for providing 6 hours of test preparation for teacher certification candidates, the UNT TExES Advising Office (TAO) administers the College of Education TExES Practice Exams. Students who want to take a practice exam should contact the TAO (Matthews Hall 103). Students may take up to *two exams* per session that relate to their teaching track/field at UNT. Students should also plan accordingly, as they are required to stay for the entire testing period. Current students must meet the following criteria in order to sit for the TExES practice exams: Students must (1) be admitted to Teacher Education, (2) have a certification plan on file with the COE Student Advising Office, and (3) be enrolled in coursework for the current semester. For TExES practice exam registration, go to: <http://www.coe.unt.edu/texes-advising-office/texes-practice-exam-registration>. If you need special testing accommodations, please contact the TAO at 940-369-8601 or e-mail the TAO at coe-tao@unt.edu. The TAO website is [www.coe.unt.edu/texes](http://www.coe.unt.edu/texes). Additional test preparation materials (i.e. Study Guides for the TExES) are available at www.texes.ets.org.

*“Ready to Test” Criteria for Teacher Certification Candidates* . Teacher certification candidates should take the TExES exams relating to their respective certification tracks/teaching fields during their early-field-experience semester (i.e. the long semester or summer session immediately prior to student teaching).

NOTE: THIS COURSE SYLLABUS/SCHEDULE IS INTENDED TO BE A GUIDE AND MAY BE MODIFIED AT ANY TIME AT THE INSTRUCTOR’S DISCRETION.

**Conceptual Framework:**

**The Educator as Agent of Engaged Learning**

Improving the quality of education in Texas schools and elsewhere is the goal of programs for the education of educators at the University of North Texas. To achieve this goal, programs leading to teacher certification and advanced programs for educators at the University of North Texas (1) emphasize content, curricular, and pedagogical knowledge acquired through research and informed practice of the academic disciplines, (2) incorporate the Texas Teacher Proficiencies for learner-centered education, (3) feature collaboration across the university and with schools and other agencies in the design and delivery of programs, and (4) respond to the rapid demographic, social, and technological change in the United States and the world.

The educator as agent of engaged learning summarizes the conceptual framework for UNT's basic and advanced programs. This phrase reflects the directed action that arises from simultaneous commitment to academic knowledge bases and to learner centered practice. "Engaged learning" signifies the deep interaction with worthwhile and appropriate content that occurs for each student in the classrooms of caring and competent educators. "Engaged learning" features the on-going interchange between teacher and student about knowledge and between school and community about what is worth knowing. This conceptual framework recognizes the relationship between UNT and the larger community in promoting the commitment of a diverse citizenry to life-long learning. In our work of developing educators as agents of engaged learning, we value the contributions of professional development schools and other partners and seek collaborations which advance active, meaningful, and continuous learning.

Seeing the engaged learner at the heart of a community that includes educators in various roles, we have chosen to describe each program of educator preparation at UNT with reference to the following key concepts, which are briefly defined below.

1. Content and curricular knowledge refer to the grounding of the educator in content knowledge and knowledge construction and in making meaningful to learners the content of the PreK-16 curriculum.

2. Knowledge of teaching and assessment refers to the ability of the educator to plan, implement, and assess instruction in ways that consistently engage learners or, in advanced programs, to provide leadership for development of programs that promote engagement of learners.

3. Promotion of equity for all learners refers to the skills and attitudes that enable the educator to advocate for all students within the framework of the school program.

4. Encouragement of diversity refers to the ability of the educator to appreciate and affirm formally and informally the various cultural heritages, unique endowments, learning styles, interests, and needs of learners.

5. Professional communication refers to effective interpersonal and professional oral and written communication that includes appropriate applications of information technology.

6. Engaged professional learning refers to the educator's commitment to ethical practice and to continued learning and professional development.

Through the experiences required in each UNT program of study, we expect that basic and advanced students will acquire the knowledge, skills, and dispositions appropriate to the educational role for which they are preparing or in which they are developing expertise.

A broad community stands behind and accepts responsibility for every engaged learner. UNT supports the work of PreK-16 communities through basic and advanced programs for professional educators and by promoting public understanding of issues in education.

This course syllabus is intended to be a guide and may be amended at any time by the instructor.