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2019

### EDEC 331-BL Science and Mathematics Methods for Early Childhood

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**XAVIER UNIVERSITY**  
**College of Professional Sciences**  
**Department of Childhood Education**  
**EDEC 331-BL Science and Mathematics Methods For Early Childhood**  
**Fall Semester 2019 – (4 semester hours)**  
**Thursday 8:00 a.m. – 12:00 p.m.**

**\*\*\*Please complete both your BCI/FBI check and TB testing immediately. You MUST have your background checks before starting in your field placement.**

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***Mandatory:*** *Leave cell phones in pockets, purses or backpacks. If you have an emergency call or text that needs to be taken care of, please leave the room quietly and make the call or text outside in the lobby area. No exceptions without prior notification.*

**Department of Childhood Education & Literacy Mission Statement:**

Xavier University's Department of Childhood Education is dedicated to the pursuit of knowledge and to the orderly discussion of critical issues confronting educators in a free, inquiry-based environment committed to current and relevant scholarship and research related to our profession. Xavier University seeks to create awareness of social justice in all disciplines through its emphasis on living the Jesuit tradition of intellectual, moral, and spiritual preparation. The candidates in the Early and Middle Childhood programs, through their academic and professional training, are prepared to value the lives of children regardless of racial, linguistic, socio-economic, religious, or ethnic background and to work with and value family and school structures in both urban, rural, and suburban settings. Special attention is given to developmentally effective practices and advocacy for all children, with ethical issues and values as expressed through the Jesuit tradition. Thus, the Childhood Education preparation at Xavier University strives to send out into the education community candidates who are morally sensitive to the academic and social needs of our time, foster an appreciation for human diversity, reason critically, and think creatively. Candidates in the Childhood Education Department are encouraged to develop and maintain a disposition toward lifelong learning in the profession of education and to the service of their students and their students' families and communities.

**Course Description and Rationale:**

This course is designed to prepare candidates to teach science and mathematics to children age 3 to grade 3. There are field experiences and clinical hours connected with this course. The general learning format for the course will consist of hands-on activities, demonstrations, peer teaching, class discussions, and field experiences. Candidates are required to be active in their own learning

and to be reflective about information presented in the course, their own teaching, and the learning of early childhood students.

**TEXTS:**

**Required:** Van de Walle, J. A. & Lovin L. H. (2018). *Teaching Student-Centered Mathematics Developmentally Appropriate Instruction for Grades Pre-K-2*. 3rd ed. Boston, MA: Pearson Education, Inc. **Please get the online version.**

**Required:** Edson, Marcia Talhelm (2013). *Starting with Science: Strategies for Introducing Young Children to Inquiry*. Portland, ME: Stenhouse Publishers.

***Additional Readings as assigned on the National Science Teachers Association's Learning Center.***

1. Create a free account here: <http://learningcenter.nsta.org/>
2. Then, view Dr. Angelone's collection of resources here:  
[http://learningcenter.nsta.org/mylibrary/collection.aspx?id=Ke1N4rd1Np0\\_E](http://learningcenter.nsta.org/mylibrary/collection.aspx?id=Ke1N4rd1Np0_E)

***Ohio's Learning Standards for Mathematics.*** Standards are available online at:  
<http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Mathematics/Ohio-s-Learning-Standards-in-Mathematics/MATH-Standards-2017.pdf.aspx?lang=en-US>

***Ohio's K-8 Mathematics Learning Progressions.*** Standards are available online at:  
<http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Mathematics/Ohio-s-Learning-Standards-in-Mathematics/Ohio-s-K-8-Learning-Progressions.pdf.aspx?lang=en-US>

***Ohio's Learning Standards: Science Standards.*** Standards are available online at:  
<http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Science/Ohios-Learning-Standards-and-MC/SciFinalStandardsMC060719.pdf.aspx?lang=en-US>

***Next Generation Science Standards.*** Standards are available online at:  
<https://www.nextgenscience.org/>

**Recommended:**

Ansberry, K. & Morgan, E. (2013). *Even More Picture Perfect Science Lessons: Using Children's Books to Guide Inquiry, K-5*. Arlington, VA: NSTA Press.

Battelle for Kids, (2015). Vertical Progression Guide for the Common Core: Mathematics K -12. Columbus, OH: Battelle for Kids.

National Council of Teachers of Mathematics (2015). Principles To Actions: Ensuring Mathematical Success for All Students.

**STANDARDS:**

***Standards for Ohio Educators (SOE):*** The State Board of Education adopted the new teacher, principal and professional development standards in October 2010. The *Standards for Ohio Educators* details the standards and how they can be used. [http://education.ohio.gov/getattachment/Topics/Teaching/Educator-Equity/Ohio-s-Educator-Standards/StandardsforEducators\\_revaug10.pdf.aspx](http://education.ohio.gov/getattachment/Topics/Teaching/Educator-Equity/Ohio-s-Educator-Standards/StandardsforEducators_revaug10.pdf.aspx)

- 1: Teachers understand student learning and development and respect the diversity of the students they teach.
- 2: Teachers know and understand the content area for which they have instructional responsibility.
- 3: Teachers understand and use varied assessments to inform instruction, evaluate and ensure student

learning.

- 4: Teachers plan and deliver effective instruction that advances the learning of each individual student.
- 5: Teachers create learning environments that promote high levels of learning and achievement for all students.
- 6: Teachers collaborate and communicate with students, parents, other educators administrators and the community to support student learning.
- 7: Teachers assume responsibility for professional growth, performance and involvement as an individual and as a member of a learning community.

*National Association for the Education of Young Children (NAEYC)*

*2010 Standards for Initial Early Childhood Professional Preparation*

[https://www.naeyc.org/caep/files/caep/Initial\\_2pager.pdf](https://www.naeyc.org/caep/files/caep/Initial_2pager.pdf)

**STANDARD 1. PROMOTING CHILD DEVELOPMENT AND LEARNING**

Candidates prepared in early childhood degree programs are grounded in a child development knowledge base. They use their understanding of young children’s characteristics and needs, and of multiple interacting influences on children’s development and learning, to create environments that are healthy, respectful, supportive, and challenging for each child.

Key elements of Standard 1

- 1a: Knowing and understanding young children’s characteristics and needs, from birth through age 8.
- 1b: Knowing and understanding the multiple influences on early development and learning
- 1c: Using developmental knowledge to create healthy, respectful, supportive, and challenging learning environments for young children

**STANDARD 2. BUILDING FAMILY AND COMMUNITY RELATIONSHIPS**

Candidates prepared in early childhood degree programs understand that successful early childhood education depends upon partnerships with children’s families and communities. They know about, understand, and value the importance and complex characteristics of children’s families and communities. They use this understanding to create respectful, reciprocal relationships that support and empower families, and to involve all families in their children’s development and learning.

Key elements of Standard 2

- 2a: Knowing about and understanding diverse family and community characteristics
- 2b: Supporting and engaging families and communities through respectful, reciprocal relationships
- 2c: Involving families and communities in young children’s development and learning

**STANDARD 3. OBSERVING, DOCUMENTING, AND ASSESSING TO SUPPORT YOUNG CHILDREN AND FAMILIES**

Candidates prepared in early childhood degree programs understand that child observation, documentation, and other forms of assessment are central to the practice of all early childhood professionals. They know about and understand the goals, benefits, and uses of assessment. They know about and use systematic observations, documentation, and other effective assessment strategies in a responsible way, in partnership with families and other professionals, to positively influence the development of every child.

Key elements of Standard 3

- 3a: Understanding the goals, benefits, and uses of assessment – including its use in development of appropriate goals, curriculum, and teaching strategies for young children
- 3b: Knowing about and using observation, documentation, and other appropriate assessment tools and approaches, including the use of technology in documentation, assessment and data collection.
- 3c: Understanding and practicing responsible assessment to promote positive outcomes for each child, including the use of assistive technology for children with disabilities.
- 3d: Knowing about assessment partnerships with families and with professional colleagues to build effective learning environments

**STANDARD 4. USING DEVELOPMENTALLY EFFECTIVE APPROACHES**

Candidates prepared in early childhood degree programs understand that teaching and learning with young children is a complex enterprise, and its details vary depending on children’s ages, characteristics, and the settings within which teaching and learning occur. They understand and use positive relationships and supportive interactions as the foundation for their work with young children and families. Candidates know, understand, and use a wide array of developmentally appropriate approaches, instructional strategies,

and tools to connect with children and families and positively influence each child's development and learning.

Key elements of Standard 4

4a: Understanding positive relationships and supportive interactions as the foundation of their work with young children

4b: Knowing and understanding effective strategies and tools for early education, including appropriate uses of technology

4c: Using a broad repertoire of developmentally appropriate teaching/learning approaches

4d: Reflecting on own practice to promote positive outcomes for each child

**STANDARD 5. USING CONTENT KNOWLEDGE TO BUILD MEANINGFUL CURRICULUM**

Candidates prepared in early childhood degree programs use their knowledge of academic disciplines to design, implement, and evaluate experiences that promote positive development and learning for each and every young child. Candidates understand the importance of developmental domains and academic (or content) disciplines in early childhood curriculum. They know the essential concepts, inquiry tools, and structure of content areas, including academic subjects, and can identify resources to deepen their understanding. Candidates use their own knowledge and other resources to design, implement, and evaluate meaningful, challenging curriculum that promotes comprehensive developmental and learning outcomes for every young child.

Key elements of Standard 5

5a: Understanding content knowledge and resources in academic disciplines: language and literacy; the arts – music, creative movement, dance, drama, visual arts; mathematics; science, physical activity, physical education, health and safety; and social studies.

5b: Knowing and using the central concepts, inquiry tools, and structures of content areas or academic disciplines

5c: Using own knowledge, appropriate early learning standards, and other resources to design, implement, and evaluate developmentally meaningful and challenging curriculum for each child.

**STANDARD 6. BECOMING A PROFESSIONAL**

Candidates prepared in early childhood degree programs identify and conduct themselves as members of the early childhood profession. They know and use ethical guidelines and other professional standards related to early childhood practice. They are continuous, collaborative learners who demonstrate knowledgeable, reflective and critical perspectives on their work, making informed decisions that integrate knowledge from a variety of sources. They are informed advocates for sound educational practices and policies.

Key elements of Standard 6

6a: Identifying and involving oneself with the early childhood field

6b: Knowing about and upholding ethical standards and other early childhood professional guidelines

6c: Engaging in continuous, collaborative learning to inform practice; using technology effectively with young children, with peers, and as a professional resource.

6d: Integrating knowledgeable, reflective, and critical perspectives on early education

6e: Engaging in informed advocacy for young children and the early childhood profession

**STANDARD 7. EARLY CHILDHOOD FIELD EXPERIENCES**

Field experiences and clinical practice are planned and sequenced so that candidates develop the knowledge, skills and professional dispositions necessary to promote the development and learning of young children across the entire developmental period of early childhood – in at least two of the three early childhood age groups (birth – age 3, 3 through 5, 5 through 8 years) and in the variety of settings that offer early education (early school grades, child care centers and homes, Head Start programs).

Key elements of Standard 7

7a. Opportunities to observe and practice in at least two of the three early childhood age groups (birth – age 3, 3-5, 5-8)

7b. Opportunities to observe and practice in at least two of the three main types of early education settings (early school grades, child care centers and homes, Head Start programs)

***NCTM National Council of Teachers of Mathematics Principles (NCTMP):***

1. **Equity.** Excellence in mathematics education requires equity—high expectations and strong support for all students.
2. **Curriculum.** A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching.** Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning.** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment.** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology.** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

### **2020 NSTA Preservice Science Standards:**

<http://static.nsta.org/pdfs/2020NSTAStandards.pdf>

#### **NSTA Standard 1: Content Knowledge**

Effective teachers of science understand and articulate the knowledge and practices of contemporary science. They interrelate and interpret important concepts, ideas, and applications in their fields of licensure.

Below are the elements of the standard.

Preservice teachers will:

- 1a) Understand the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields. Explain the nature of science and the cultural norms and values inherent to the current and historical development of scientific knowledge.
- 1b) Demonstrate knowledge of crosscutting concepts, disciplinary core ideas, practices of science and engineering, the supporting role of science-specific technologies, and contributions of diverse populations to science.
- 1c) Demonstrate knowledge of how to implement science standards, learning progressions, and sequencing of science content for teaching their licensure level PK-12 students.

#### **NSTA Standard 2: Content Pedagogy**

Effective teachers of science plan learning units of study and equitable, culturally-responsive opportunities for *all* students based upon their understandings of how students learn and develop science knowledge, skills, and habits of mind. Effective teachers also include appropriate connections to science and engineering practices and crosscutting concepts in their instructional planning.

Preservice teachers will design lessons:

- 2a) Using science standards and a variety of appropriate, student-centered, and culturally-relevant science disciplinary-based instructional approaches that follow safety procedures and incorporate science and engineering practices, disciplinary core ideas, and crosscutting concepts.
- 2b) Incorporating appropriate differentiation strategies, wherein *all* students develop conceptual knowledge and an understanding of the nature of science. Lessons should engage students in applying science practices, clarifying relationships, and identifying natural patterns from empirical experiences.
- 2c) Using engineering practices in support of science learning wherein all students design, construct, test and optimize possible solutions to a problem.
- 2d) Aligning instruction and assessment strategies to support instructional decision making that identifies and addresses student misunderstandings, prior knowledge, and naïve conceptions.
- 2e) Integrating science-specific technologies to support *all* students' conceptual understanding of science and engineering.

#### **NSTA Standard 3: Learning Environments**

Effective teachers of science are able to plan for engaging *all* students in science learning by setting appropriate goals that are consistent with knowledge of how students learn science and are aligned with state and national standards. Plans reflect the selection of phenomena appropriate to the social context of the classroom and community, and safety considerations, to engage students in the nature of science and

science and engineering practices. Effective teachers create an anti-bias, multicultural, and social justice learning environment to achieve these goals.

Below are the elements of the standard.

Preservice teachers will:

- 3a) Plan a variety of lesson plans based on science standards that employ strategies that demonstrate their knowledge and understanding of how to select appropriate teaching and motivating learning activities that foster an inclusive, equitable, and anti-bias environment.
- 3b) Plan learning experiences for *all* students in a variety of environments (e.g., the laboratory, field, and community) within their fields of licensure.
- 3c) Plan lessons in which all students have a variety of opportunities to investigate, collaborate, communicate, evaluate, learn from mistakes, and defend their own explanations of: scientific phenomena, observations, and data.

#### **NSTA Standard 4: Safety**

Effective teachers of science demonstrate biological, chemical, and physical safety protocols in their classrooms and workspace. They also implement ethical treatment of living organisms and maintain equipment and chemicals as relevant to their fields of licensure.

Below are the elements of the standard.

Preservice teachers will:

- 4a) Implement activities appropriate for the abilities of all students that demonstrate safe techniques for the procurement, preparation, use, storage, dispensing, supervision, and disposal of all chemicals/materials/equipment used within their fields of licensure.
- 4b) Demonstrate an ability to: recognize hazardous situations including overcrowding; implement emergency procedures; maintain safety equipment; provide adequate student instruction and supervision; and follow policies and procedures that comply with established state and national guidelines, appropriate legal state and national safety standards (e.g., OSHA, NFPA, EPA), and best professional practices (e.g., NSTA, NSELA).
- 4c) Demonstrate ethical decision-making with respect to safe and humane treatment of all living organisms in and out of the classroom, and comply with the legal restrictions and best professional practices on the collection, care, and use of living organisms as relevant to their fields of licensure.

#### **NSTA Standard 5: Impact on Student Learning**

Effective teachers of science provide evidence that students have learned and can apply disciplinary core ideas, crosscutting concepts, and science and engineering practices as a result of instruction. Effective teachers analyze learning gains for individual students, the class as a whole, and subgroups of students disaggregated by demographic categories, and use these to inform planning and teaching.

Below are the elements of the standard.

Preservice teachers will:

- 5a) Implement assessments that show all students have learned and can apply disciplinary knowledge, nature of science, science and engineering practices, and crosscutting concepts in practical, authentic, and real-world situations.
- 5b) Collect, organize, analyze, and reflect on formative and summative evidence and use those data to inform future planning and teaching.
- 5c) Analyze science-specific assessment data based upon student demographics, categorizing the levels of learner knowledge, and reflect on results for subsequent lesson plans.

#### **Standard 6: Professional Knowledge and Skills**

Effective teachers of science strive continuously to improve their knowledge and understanding of the ever changing knowledge base of both content, and science pedagogy, including approaches for addressing inequities and inclusion for *all* students in science. They identify with and conduct themselves as part of the science education community.

Below are the elements of the standard.

Preservice teachers will:

- 6a) Engage in critical reflection on their own science teaching to continually improve their instructional effectiveness.
- 6b) Participate in professional development opportunities to deepen their science content knowledge and practices.

6c) Participate in professional development opportunities to expand their science-specific pedagogical knowledge.

**COURSE OUTCOMES:** The candidate will learn and be able to—

- Use current, effective methods and materials for teaching early childhood science and mathematics. (SOE 4; NCTM 3; NSTA 2a, 2b; NAEYC 4b, 4c)
- Integrate science and mathematics curricular objectives with other subject disciplines. (SOE 5; NSTA 1a, 1b; NAEYC 5a, 5b)
- Integrate technology into science and mathematics curricular objectives. (SOE 5; NCTM 6; NSTA 1b, 2b; NAEYC 4b)
- Choose and use appropriate assessment and evaluation tools. (SOE 4; NCTM 5; NSTA 2c, 3c, 5a; NAEYC 3b, 3c)
- Describe and utilize appropriate early childhood mathematics and science curricular concepts, processes, and attitudes based on national and state standards. (SOE 2; NCTM 2; NSTA 1c; NAEYC 5a, 5b, 5c)
- Plan and deliver effective science and mathematics lessons to all learners that meet the individual needs of the diverse classroom. (SOE 1; NCTM 1; NSTA 3a, 3b; NAEYC 1c)
- Select appropriate materials to support early childhood science and mathematics instruction. (SOE 5; NCTM 6; NSTA 3a; NAEYC 4b)
- Use and teach scientific process skills. (NSTA 2b; NAEYC 4c)
- Participate in a professional development experience. (SOE 7; NSTA 6a, 6b; NAEYC 6a, 6c)
- Reflect on one's science and mathematics teaching, learning, and content knowledge. (NSTA 5a; NAEYC 4d)
- Display enthusiasm and confidence in teaching science and mathematics. (SOE 2; NAEYC 1c, 4a)
- Analyze and discuss current issues in science and mathematics education. (SOE 7; NSTA 6a, 6b; NAEYC 6c)

### **Oral Communication Student Learning Outcomes**

By the end of this course you will have a better understanding of specific communication skills and knowledge needed to teach effective math and science lessons to students age 3 through third grade.

- **OCF SLO 1, Adapt to the communication context**
- **OCF SLO 2, Organize Information Effectively**
- **OCF SLO 3, Advocate a supported opinion on complex topics**
- **OCF SLO 4, Critique Challenging Messages**
- **OCF SLO 5, Present Messages through a variety of modalities**

<u>Assignment</u>	<u>Points</u>	<u>Grading Scale</u>
Reading Assignments	50	A 95-100%
Professional Development Experience	25	A- 93-94%
Math Unit Lesson Plan	25	B+ 90-92%
Math Unit Peer Lesson Presentation	25	B 87-89%
Science Unit Lesson Plan	25	B- 85-86%
Science Unit Peer Lesson Presentation	25	C+ 82-84%
Blended Science Learning Center	20	C 78-81%
Math Diagnostic Interview	25	C- 75-77%

3 quizzes (30 points each)	90	D+ 72-74%
Field Experience Binder	50	D 69-71%
Final Exam	40	D- 65-68%
<b>Total</b>	<b>400</b>	F Below 65%

ASSIGNMENTS	POINTS	SOE	NAEYC	NCTMP	NSTA	Oral Communication	Accreditation Assessment
Reading Assignments	<b>50</b>	7	4b, 6c	3, 4	6a	2,3,4	
Math/Science Unit Lesson Plan	<b>25(each)</b>	1-4	3b, 4b, 5b	3- 5	2, 3, 5	1,2,3	
Math/Science Peer Lesson Presentation	<b>25(each)</b>	1- 5	3b, 4b, 5b	3- 5	2, 3, 5	1,2,3,5	
Blended Science Learning Center	<b>20</b>	1,2,4	4b, 4c, 5b	3-5	2a, 2b, 3a		
Professional Development	<b>25</b>	7	6a, 6c	1-6	6a, 6b	4	
Math Diagnostic	<b>25</b>	1- 3	3b	2- 5			√
Field Experience Binder	<b>50</b>	1-7	1-7	1-6	1-6		
Quizzes	<b>30(each)</b>	2	1-6	2- 4	1-6		

### Professionalism

Professional behavior is that which is expected of all teachers. This course is part of an accredited teacher preparation program, which leads to professional licensure. Candidates are required to demonstrate behavior consistent with a professional career. In particular, candidates are expected to:

- **Cell Phones:** *Leave cell phones in pockets, purses or backpacks. If you have an emergency call or text that needs to be taken care of, please leave the room quietly and make the call or text outside in the lobby area. No exceptions without prior notification.*
- **Computers:** *Please do not use your personal computers to check emails, Facebook or other sites during class. If you choose to use your computer to take notes that is acceptable use. Other usage will result in being asked to leave your computer in your bag during class.*
- **Attendance:** The Xavier University catalogue states “In order to earn credit in any course for which he/she is registered, the student is required to attend classroom and laboratory exercises regularly and promptly. Lack of reasonable attendance as determined by the individual faculty member is reason for denial of credit for a course and possible course failure.” Students are expected to attend all class meetings and field experiences. Attendance will be taken. If you will not be in class, you should call or email. The instructor must be notified of any absences **in advance**. **More than two absences can result in failure of the class. Extended medical or family emergency**

**absences should seek approval of the Associate Dean of the College Professional Sciences, Dr. Dennis Long, 513-745-3495.**

- **Prepare** carefully and completely for class. Candidates should read the text and handout assignments as indicated on the course calendar and prepared to discuss the assigned readings during class. Correct grammar, mechanics, and spelling must be evident in all work that is submitted. All assignments must be word processed. **The standards for quality of written assignments are high.**
- **Be Honest!** The Education Department values academic honesty. It is expected that each candidate will submit original work. Where others' works and ideas are used, citations must be included. Please refer to the *Xavier University Catalog* for the official statement and consequences.
- Assignments are due on the date noted on the syllabus. **Grades for assignments submitted past the due date will be reduced two points for each day late.** Assignments are considered late if they are turned in after the start of class.
- Collaborate responsibly with colleagues. Candidates are expected to work cooperatively and fulfill their collegial responsibilities. Interact professionally with professor and classmates. Professional behavior includes cooperation with other Candidates, faculty and school personal. Be on time and be prepared! This course is a checkpoint for professional behavior.

#### **Reading Assignments Throughout the semester**

You will be checked on your reading in a variety of ways throughout the semester, which could include quizzes, reflective writing, discussion, etc.

#### **Peer Unit Lesson Plans Due Dates Vary**

Each candidate will be responsible for developing a detailed lesson plan in mathematics and science with a small group. The lesson plan will be one of a sequence of three in a larger "unit." The small group will divide into three groups of 2-3 and each group of 2-3 will write and present one lesson in the sequence. All three lessons in the sequence will be presented on the same day. The learning cycle teaching approach, 5-E model is to be utilized for both the science and math lessons. Technology integration **MUST** be included in each lesson. All worksheets, questions for discussion, and materials must be included. Each plan must include *Ohio's Learning Standards for Math or Science* addressed in the lesson. The lesson plan is due the week prior to your peer presentation. It must be emailed. The final lesson plan is due on the day of your peer presentation. No further modifications can be made after this time. You will also submit a lesson plan for each field observation and a sequence of 3 for your Math/Science Unit Assignment (taught in the field).

#### **Peer Unit Lesson Presentations Due Dates Vary**

Using the lesson plans mentioned above, one in science and one in mathematics, you and your group will make an abbreviated presentation of the lesson to your peers. Each lesson **MUST be taught** using the **learning cycle** approach. The lesson should be approximately fifteen minutes in length. Be prepared to answer adult level questions following the presentation. The basis of evaluation for this presentation will be on the following: effective use of the learning cycle, the level of student involvement, the accuracy of scientific or mathematics information given and its discussion, effective questioning techniques, effectiveness of presentation, and overall effort. It is important that you present yourself professionally during this activity (you should act like the teacher during this presentation). A checklist of evaluation criteria will be given to you.

Submit a copy of the lesson electronically one week prior to your presentation. These lesson plans will be posted on Canvas and shared with the class. Also bring a hard copy on the date of the presentation to be turned in to the instructor.

**Blended Science Learning Center Due November 15<sup>th</sup>**

Science Learning Center – Prepare instructions and materials for a science activity that students could do in a learning center online. The instructions need to be online on a website or in a learning management system like Schoology or Edmodo that will allow the center to be used over and over. Specify the topic, grade level, the number of students who will use the activity at one time, and explain how it addresses *Ohio's New Learning Standards in Science*. If there are student worksheets to be completed, those must be included. Explain how the center will be assessed. The activity and materials need to be in a self-contained package. If the activity requires student-provided materials such as crayons or glue stick, please note that on your instructions, but you do not need to include those in the “kit” you prepare.

**Professional Development Experience Due within 72 hours of the event**

Each candidate will attend a professional science or math-related conference.

**Reflective Analysis:** Each candidate will submit a 3-5 page reflective analysis of their experience by responding to the following questions **within 72 hours of attending the experience**: 1) Give a one page summary of the activity. The following 2-4 pages should cover the remaining 3 questions with emphasis on the next question. 2) How did this experience contribute to your professional content knowledge and pedagogy of teaching mathematics **and/or** science in the early childhood classroom? Did this experience affect your attitude towards the teaching of mathematics **or** science? If so, explain. Provide specific examples to support your response. 3) How can you use what you learned in the teaching of science **or** math? 4) What is your overall response to this experience?

**Please include documentation that you attended the event.**

**The Educators Expo is at the Cincinnati Zoo on Tuesday, September 24, 2019 from 2:30 – 6:00.** This is a wonderful FREE professional development opportunity. Register for the event at <http://cincinnati-zoo.org/events/ultimate-educator-expo-2/>

*Other events may become available throughout the semester. You must have any event you attend approved by one of the two instructors. It is your responsibility to attend a professional development in math or science prior to the end of the semester.*

**Mathematics Diagnostic Interview Due November 25<sup>th</sup>**

Choose a student during your field experience that is experiencing difficulty in mathematics. Construct a diagnostic test, based on the necessary pre-requisite skills for the skill at hand, and the skill itself. Work one-on-one with the student administering the diagnostic test. Remember not to assist, nor should you leave the student to complete the test alone. Note the student's behavior while performing the required tasks, (facial expressions, squirming, counting with fingers under the desk, etc.) A copy of the diagnostic test, the student's response with teacher annotations, along with an analysis and recommendations should be submitted electronically. In the analysis discuss why you chose items for the interview, a brief description of the selected student, including age, gender, previous observations, performance, needs, etc. Include samples of the child's response with teacher annotations regarding specific inferences and or observations related to specific responses. Include inferences to be made from this interview along with a detailed summary of the child's strengths & weaknesses, followed by suggestions for appropriate teaching methods, materials, etc.

### **Field Placement Participation:**

**You are to prepare lesson plans and teach three math and three science lessons in your field placement.**

Please note that a lesson plan must be completed prior to teaching. Your plan must be submitted to the classroom teacher prior to teaching - NO EXCEPTIONS! Your teacher must have the appropriate time to review your lesson plan and provide feedback before you teach it. This will benefit everyone as well as show professional courtesy to your supervising teacher. After the completion of each lesson you should write a written reflection (use the reflection activity form). You must have your cooperating teacher initial your plan indicating she/he has reviewed the plan prior to teaching and observed your lesson.

\*\*\*Please provide a copy of the lesson plan on the date of your observation as well as a copy of any handouts being used in the classroom.

**\*\*\*Please complete both your BCI/FBI check and TB testing immediately. You MUST have your background checks before starting in your field placement.**

### **Field Binder:**

As you participate in the field, you will be collecting artifacts that align with the Ohio Standards for the Teaching Profession. There is a guidance document for appropriate artifacts in Files on Canvas. \*\*We are piloting a digital option using Weebly another digital option of your choice (please schedule time with Dr. Angelone if you would like to try this option).

### **Student Support**

The **Office of Academic Support(OAS)** offers tutoring, Supplemental Instruction (SI), and study groups. For information about these services, contact Stephanie Daniels at 745-3214 or [danielss3@xavier.edu](mailto:danielss3@xavier.edu). The OAS is located on the fifth floor of the Conaton Learning Commons, Suite 514.

### **Students with Disabilities**

Xavier University is committed to providing equal opportunity and access to the educational experience through the provision of reasonable accommodations. For students who have an accommodations letter from Disability Services, it is essential that you email the letter and meet with me as soon as possible to discuss your disability-related accommodation needs for this course.

If you have not yet met with Disability Services to arrange accommodations, it is necessary that you do so as soon as possible as accommodations are not retroactive. If you would like information regarding eligibility for academic accommodations due to barriers associated with a potential disability, please contact Cassandra Jones, Director of Disability Services, by phone at 513-745-3280, in person on the Fifth Floor of the Conaton Learning Commons, Room 514, or via e-mail at [jonesc20@xavier.edu](mailto:jonesc20@xavier.edu) to coordinate reasonable accommodations as soon as possible. Please contact Disability Services well in advance of needing an accommodation as the registration process can take several weeks.

\* It is important to note that any disability-related information including accommodations is confidential.

**We are Xavier Musketeers-All for One and One for All.**

As members of the Xavier University community, the Jesuit value of Cura Personalis invites us care for others recognizing the uniqueness and wholeness of each person and their situation. As such, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus community remains a healthy and safe environment for learning. To that end, as a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, physical or mental health issues, death of a loved one, increased anxiety, substance use, feeling down, difficulty concentrating/or lack of motivation, food or housing insecurity, etc. These concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. **Resources and services are available at Xavier and are listed below.**

You may also find yourself in a situation in which you come across a fellow classmate whose personal behavior concerns or worries you, either for the classmate's well-being or yours. When either situation is the case, I encourage you to share this information with me for resource information and potential accommodations. You are also encouraged to report this information via Xavier's Student of Concern form: <https://one.xavier.edu/students/>. The form is on the Student Hub and is in the middle of the page next to Events.

For any student who facing **challenges securing food or housing** and believes this may affect their performance in the course, you are urged to contact Cindy Stieby, Coordinator for the X-Path Program, or Angie Kneflin, Director Of Care Management through the following e-mail address: [thestore@xavier.edu](mailto:thestore@xavier.edu). The store is open on Fridays in gazebo area of the Village apartments from 3pm-5pm or by appointment through Cindy or Angie. Furthermore, please notify me if you are comfortable doing so. This will enable me to provide additional resource information and discuss potential accommodations.

### **Xavier Student Wellness Support Resources:**

#### **McGrath Health and Wellness Counseling Services:**

513-745-3022 ext. 2

<http://www.xavier.edu/health-wellness/>

McGrath provides both counseling and psychotherapeutic treatment by clinical counselors, psychologists, social workers and counseling interns. Services are free for Xavier students (undergraduate and graduate). If you need an **immediate crisis appointment** please let the staff answering the phone know this. Additionally, **crisis counselors are available 24/7** by calling Xavier University Police (513-745-1000) and asking to talk to the counselor on call. Additionally, McGrath counseling services also offers support groups, health coaching and mindfulness workshops)

#### **McGrath Health and Wellness-Health Services:**

513-745-3022 ext. 3

McGrath provides high quality and accessible medical treatment, prevention and education to students.

#### **Psychological Services Center:**

513-745-3531

<http://www.xavier.edu/psychologicalservices/welcome.cfm>

PSC provides a wide range of psychological services to all graduate and undergraduate students free of charge.

**Advocacy and Prevention Coordinator:**

513-904-9013 (M-Fri. 9am to 5pm)

<http://www.xavier.edu/advocate/survivor-resources.cfm>

The Xavier Advocacy Coordinator provides confidential support, information and advocacy for those affected by harassment, discrimination, relationship violence, sexual assault, rape and stalking during business hours. After hours, Women Helping Women (513-381-5610) provides advocacy services to all Xavier students and will connect students to the Advocacy Coordinator.

**Kate Lawson, Chief Title IX Officer:**

513-745-3046

<http://www.xavier.edu/titleix/index.cfm>

The Title IX Office investigates reports of sex discrimination, including, but not limited to, sexual harassment, sexual violence, dating violence and stalking, as well as facilitates a prompt, equitable process to resolve those complaints.

**On Campus Crisis Numbers**

XUPD will assist with crisis intervention in all situations and has access 24/7 to an on campus counselor.

Xavier University Police Department Emergency Line: 513-745-1000

Xavier University Police Department Non-Emergency Line: 513-745-2000

**Other Wellness Support Campus Resources**

**Bias Advisory Response Team (BART):** BART is an advisory group that plays an important role in developing proactive and educational initiatives that will minimize the occurrence of bias incidents on campus in addition to ensuring consistent approaches to incident responses. To report an incident contact the Dean of Students at 513-745-3166, contact XUPD at 513-745-1000 or submit a report online at <http://www.xavier.edu/dean-of-students/>

**Xavier Action and Care Team (X-ACT):**

X-ACT is an advisory group that provides support and assistance to students who may be experiencing emotional distress and exhibiting at-risk or threatening behaviors. If you would like to report a fellow student of concern, please submit an online referral through the Student Hub (student Concern report) or the Dean of Students website: <http://www.xavier.edu/dean-of-students/> or contact the Dean of Students at 513-745-3166. If there is an immediate threat or danger to yourself or the student of concern, please call Xavier Police immediately at 513-745-1000.

**Care Management Services:**

513-745-4391

<https://www.xavier.edu/dean-of-students/>

The area of Care Management in the Dean of Students Office is area is to support students through challenges, connect them to appropriate campus and community resources, promote growth in self-advocacy, and empower students to navigate toward their own solutions and shape their own lives. The Director of Care Management and Care Management Coordinator work collaboratively across the institution to develop support plans that provide a caring and seamless student learning experience. Additionally those working in Care Management at Xavier operates in a non-clinical capacity and is not able to provide counseling or therapy to students, though would quickly connect students to those resources if appropriate. The Director of Care Management receive all referrals for X-ACT that are designated emotional concerns.

**Office of Disability Services:**

513-745-3280

<http://www.xavier.edu/disability-services/index.cfm>

The Disability Services staff ensure all students with disabilities can freely and actively participate in all facets of university life. This office provides and coordinates support services to maximize students' educational potential and develop their independence to the fullest extent possible.

**Center for Diversity & Inclusion:**

513-745-3110

<http://www.xavier.edu/diversity-inclusion/index.cfm>

The Center for Diversity and Inclusion is committed to advising, developing, educating, and empowering students at Xavier to make the most of their diverse interactions across a wide range of social identities.

**Office of Residence Life:**

513-745-3203

<http://www.xavier.edu/residence-life/index.cfm>

The Residence Life staff (including Hall Directors and Resident Assistants) support students in their personal growth while challenging them to successfully achieve their academic goals. HDs and RAs are often a student's most direct connection to University resources. If you live on campus, contact the main office or your Hall Director or Area Coordinator for any needs.

**Student Success Center:**

513-745-3141

<https://www.xavier.edu/success/#services>

Provides academic and adjustment support, success coaching, goal setting, and advising.

**TRiO:**

513-745-3758

<https://www.xavier.edu/sss/index.cfm>

Provides academic, professional, financial and personal support for primarily first-generation, lower-income or students with disabilities. With a wide range of resources, individual services, cultural activities, plus scholarships and technological support to successfully navigate through college.

**Off Campus Local & National Websites: & Hotlines:**

- **Cincinnati Talbert House Text Line: 839863**
- **National Suicide Prevention Hotline: 1-800-273-8255**
- **The Trevor Project: 1-866-488-7386 Text 'Trevor to 1-202-304-1200**  
<http://www.thetrevorproject.org/>
- **American Foundation for Suicide Prevention: [www.afsp.org](http://www.afsp.org)**
- **Cincinnati Linder Center of Hope: 513-536-4673 <http://lindnercenterofhope.org/>**
- **Good Samaritan Hospital Behavioral Health Care: 513-862-2850**  
<https://www.trihealth.com/institutes-and-services/behavioral-health-services/>
- **National Alliance on Mental Health (NAMI): <http://nami.org/>**
- **Active Minds: <http://www.activeminds.org/>**

- **Shelterhouse**

<http://www.shelterhousecincy.org/>

David & Rebecca Barron Center for Men  
Women

Barron Center for Men

411 Gest Street

Cincinnati, OH 45203

**513-721-0643**

- **Free Store Food Bank: 513-241-1064**

<https://freestorefoodbank.org/>

112 East Liberty Street

8am-3pm M-F

Esther Marie Hatton Center for

2499 Reading Road

Cincinnati, Ohio 45202

**513-562-1980**

**Fall 2019 CALENDAR**

**EDEC 331- BL – Science and Mathematics Methods for Early Childhood**

<b>Date</b>	<b>Topic</b>	<b>Assignment</b>
August 22, 2019	Teaching Math and Science Learning for Understanding Common Core Standards, Next Generation Science Standards, & Resources	
August 29, 2019	Kuchey: Lesson Planning	<b>Van de Walle: Chapter 1, 2,</b>
	Angelone: The Learning Cycle	<b>Science and Children articles TBD</b>
September 5, 2019	Kuchey: Assessment	<b>Van de Walle: Chapters 3</b>
	Angelone: Understanding Science Inquiry, 3D Learning & Teaching Strategies; Safety	<b>Edson: Chapters 1 &amp; 2</b>
September 12, 2019	Kuchey: Differentiated Learning in Math and Science	<b>Van de Walle: Chapters 4, 5, 6 AND 7</b>
	Angelone: Understanding Science Inquiry, 3D Learning & Teaching Strategies; Safety	<b>Science and Children articles TBD</b>
September 19, 2018	Kuchey: Fundamental Concepts and Skills: Attaching Meaning to Numbers Base-Ten Concepts and Place Value	<b>Van de Walle: Chapters 8 and 11</b>
	Angelone: Science Resources and Technology (STEM conference- online or out early?)	<b>Science and Children articles TBD</b>
<b>Tuesday, September 24th</b>	<b>EDUCATORS EXPO</b>	<b>CINCINNATI ZOO (2:30-6:00 P.M.)</b>
September 26, 2019	Kuchey: Computational Strategies (+, -, x, ÷)	<b>Van de Walle: Chapters 9, 10, 12</b>
	<b>Angelone:</b> Literacy in Science & Learning Centers (online)	<b>Edson: Chapters 3 &amp; 4</b>
October 3, 2019	FALL BREAK	No Class
October 10, 2019	Kuchey: <b>Math Quiz One</b>	<b>Math Quiz One: Chapters 1-12</b>
	STEAM	
October 17, 2019	Kuchey: Early Fractions concepts Promoting Algebraic	<b>Van de Walle: Chapter 13 and 14</b>

	Reasoning	<b>Science and Children articles TBD</b>
	Angelone: STEAM (online?)	
October 24, 2019	Kuchey: Peer Presentations	<b>Peer Presentations</b>
	Angelone: Designing Inquiry Unit	<b>Edson: Chapters 5 &amp; 6</b>
October 31, 2019	Kuchey: Building Measurement Concepts	<b>Van de Walle: Chapter 15</b>
	Angelone: <b>Hamilton County Soil and Water Conservation Professional Development</b>	<b>Science and Children Articles TBD</b>
November 7, 2019	Kuchey: Developing Geometric Reasoning and Concepts	<b>Van de Walle: Chapter 16</b>
	Angelone: Designing Inquiry Unit	<b>Science and Children articles TBD</b>
November 14, 2019	Kuchey: Helping Children Use Data	<b>Van de Walle: Chapter 17</b>
	Peer Lesson Presentations	<b>Blended Science Centers Due</b>
November 21, 2018	Kuchey: Peer Lesson Presentations	<b>Math Peer Presentations Math Diagnostic Due November 25<sup>th</sup>.</b>
	Angelone: Science Quiz and Peer Lesson Presentations	<b>Science Quiz Peer Lesson Presentations</b>
November 28, 2019	<b>Happy Thanksgiving</b>	<b>No Class</b>
December 5, 2019	Kuchey: Second Quiz in Math	<b>QUIZ TWO (MATH) (Chapters 13-17 Van de Walle)</b>
	Angelone: Peer Lesson Presentations	<b>Science and Children articles TBD Peer Lesson Presentations</b>
December 12, 2019	<b>Final Exam Due</b>	<b>Final Exam</b>

*The instructor reserves the right to make changes in the syllabus and/or calendar if circumstance so dictate.*