Sequence 4
TLLSC 420: Teaching Mathematics in Elementary Grade Classrooms
TLLSC 421: Teaching Science in Elementary Classrooms
TLLSC 422: Teaching Social Studies in Elementary Grade Classrooms

Instructor Information

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor</th>
<th>Time Period</th>
<th>Details</th>
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<tbody>
<tr>
<td>TLSC 420</td>
<td>Cynthia Nelson</td>
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<tr>
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<tr>
<td>TLSC 422</td>
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Days & Times: Tuesdays and Thursdays, 8:45 a.m. to 11:45 a.m.
On-Campus Location: Cudahy Science Building (Lake Shore Campus) - Room 314
School-Site Location: Oscar Meyer Magnet School
2250 North Clifton Avenue, Chicago IL 60614 (773) 534-5535

Module Descriptions

420 Module Description
During this rigorous module, candidates learn effective methods for teaching mathematics in the elementary school. The module takes a student centered, problem solving approach that targets conceptual understanding for diverse learners. This sequence addresses TLLSC Enduring Understandings 3, 6, 7, and 9.

421 Module Description
One way to think about teaching science is to understand science as a culture. People who are scientifically literate can talk, think, act, and identify within the community of science. They understand the beliefs, ways of knowing, and central assumptions that constitute science. They understand how science is constructed, communicated, and used.
We will spend our time together exploring what it means to learn and do science in different contexts. Our explorations will take us from school classrooms to informal learning institutions around the city to broaden our conceptions of the work of “scientists” and what it means to engage in scientific inquiry. Through these experiences, we will reflect upon the possible implications for teaching science and creating opportunities for all students to participate in the culture of science.

422 Module Description
This sequence addresses the content areas of instruction with a specific focus on elementary grade classrooms. Teacher candidates will be introduced to the discipline of social studies, have experiences engaging in the teaching and learning in this discipline, and specifically work to integrate literacy into social studies.

420 IDEA Objectives:
- Gaining factual knowledge (methods)
- Learning to apply course materials
- Developing specific skills, competencies, and points of view needed by professionals in the field

420 Essential Questions:
1. How do teachers teach elementary mathematics in a developmentally appropriate way?
2. How do teachers of elementary mathematics teach conceptual understanding of mathematics?
3. How do teachers adjust and adapt learning materials and instruction for diverse learners?
4. How is problem solving most effectively taught for transfer and modeling?

421 IDEA Objectives
During this module, through large and small group instruction and discussion, hands-on learning experiences, fieldwork, and reflection, you will work toward the following essential instructional objectives:
- Gaining a broader understanding and appreciation of science as an intellectual and cultural activity
- Learning how to find and use resources for answering questions or solving problems
You will also work toward the following important instructional objectives:
- Developing specific skills, competencies, and points of view needed by teaching professionals
- Learning to apply course material in the classroom setting
421 Essential Questions:
1. How have others defined scientists and what are the implications of various understandings and misunderstandings of science?
2. How might one’s own experiences with science impact teaching and learning?
3. What is culturally relevant teaching in science?
4. How might teachers meet the needs of diverse learners through acknowledging and building upon their prior experiences, beliefs, and values?
5. How might informal learning resources support and enhance science curriculum, as well as provide relevancy to student’s learning?
6. How have the Next Generation Science Standards impacted science education?
7. How does Science relate to other disciplines, particularly mathematics and social studies?

422 IDEA Objectives:
- Developing specific skills, competencies, and points of view needed by teaching professionals
- Learning how to find and use resources for answering questions or solving problems
- Learning to apply course material in the classroom setting

422 Essential Questions:
1. What is social studies? How does that differ from the social sciences?
2. What is history and what is its relationship to social studies and the social sciences?
3. What is the value of teaching and learning social studies in schools?
4. How is literacy in content areas such as social studies supported?
5. What is the importance of argumentation and writing in the discipline of social studies?
6. What are the social and personal implications of the social studies?
Essential Understandings

420 Goals
ACEI Standards
DEVELOPMENT, LEARNING AND MOTIVATION
1.0 Development, Learning, and Motivation—Candidates know, understand, and use the major concepts, principles, theories, and research related to development of children and young adolescents to construct learning opportunities that support individual students’ development, acquisition of knowledge, and motivation.

CURRICULUM
2.3 Mathematics—Candidates know, understand, and use the major concepts and procedures that define number and operations, algebra, geometry, measurement, and data analysis and probability. In doing so they consistently engage problem solving, reasoning and proof, communication, connections, and representation;

INSTRUCTION
3.1 Integrating and applying knowledge for instruction—Candidates plan and implement instruction based on knowledge of students, learning theory, connections across the curriculum, curricular goals, and community;
3.2 Adaptation to diverse students—Candidates understand how elementary students differ in their development and approaches to learning, and create instructional opportunities that are adapted to diverse students;
3.3 Development of critical thinking and problem solving—Candidates understand and use a variety of teaching strategies that encourage elementary students’ development of critical thinking and problem solving;
3.4 Active engagement in learning—Candidates use their knowledge and understanding of individual and group motivation and behavior among students at the K-6 level to foster active engagement in learning, self-motivation, and positive social interaction and to create supportive learning environments;
3.5 Communication to foster collaboration—Candidates use their knowledge and understanding of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the elementary classroom.

ASSESSMENT
4.0 Assessment for instruction—Candidates know, understand, and use formal and informal assessment strategies to plan, evaluate and strengthen instruction that will promote continuous intellectual, social, emotional, and physical development of each elementary student.

PROFESSIONALISM
5.1 Professional growth, reflection, and evaluation—Candidates are aware of and reflect on their practice in light of research on teaching, professional ethics, and resources available for professional learning; they continually evaluate the effects of their

420 Essential Understandings:
- Incorporate research and evidence-based practices into the design of instruction (e.g. UbD, IB, SIOP and UDL). (5S; 9A) (IB)
- Design a standards-based instructional lesson that uses backward design (e.g. UbD) to align objectives with formative assessments and instructional practices based on high expectations for each student’s learning and behavior. (3H; 3I) (IB)
- Select relevant instructional content, materials, resources and strategies for differentiated and universally designed instruction. (3Q; 5O) (IB)
Use assessment strategies and devices that are nondiscriminatory, and take into consideration the impact of disabilities, methods of communication, cultural background, and primary language on measuring knowledge and performance of students. (7R) (IB)

Use data to differentiate assessments to meet the needs of diverse learners. (1H; 3J; 5P) (IB)

analyze and use student information to design instruction that meets the diverse needs of students and leads to ongoing growth and achievement (1H) (IB)

Use data to plan for differentiated instruction to allow for variations in individual learning needs (3J) (IB)

Use assessment data, student work samples, and observations from continuous monitoring of student progress to plan and evaluate effective content area reading, writing, and oral communication instruction (6H)

421 Essential Understandings
EU 3 Candidates will understand that effective educators use research and evidence-based practices to design instruction that includes the alignment of goals, objectives, assessments and instructional strategies to meet the individual needs of students.

EU 6 Candidates will understand that effective educators apply deep understanding of both content and pedagogy to provide developmentally appropriate instruction to all students.

EU 8 Candidates will understand that effective educators explicitly integrate the teaching of reading, writing, communication and technology across content areas.

EU 11 Candidates will understand that effective educators maintain and utilize global perspectives and international-mindedness when engaging in teaching, learning and leading, including the awareness and application of the social, cultural, inter-cultural and linguistic facets of student achievement.

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EU 11 Candidates will understand that effective educators maintain and utilize global perspectives and international-mindedness when engaging in teaching, learning and leading, including the awareness and application of the social, cultural, inter-cultural and linguistic facets of student achievement.
As Part of this module, candidates will:

EU3 K1 Identify what constitutes research and evidence-based practices related to designing and implementing instruction. (c1G) (IB)

EU3 K2 Explain the scope and sequence in relevant standards (national, IL, CCSS). (c1A)

EU3 K3 Explain how to adjust scope and sequence in standards-based curriculum maps to meet the needs of diverse learners. (c1A) (IB)

EU6 K1 Describe the important facts and central concepts, principles, and theories associated with their certified content areas. (b1B, b1G)

EU6 K2 Identify the content standards and the scope and sequence of the subject area of their certified content areas. (b1B)

EU6 K3 Describe how their subject is related to other disciplines. (b1D) (IB)

EU6 K7 Describe content-specific instructional strategies.

EU6 K8 Explain the various models of co-teaching and the procedures for implementing them across the curriculum. (h1G) (IB)

EU6 K9 Describe how to conduct and interpret appropriate content specific assessments. (g1A, g1G)

EU6 K10 Describe appropriate technologies to enhance student learning (b1F, c1E) (IB)

EU11 K2 Describe how global issues can be infused into instructional practice to inspire inter-cultural awareness and international mindedness. (i1G) (IB)

EU11 K6 Describe how instruction utilizes transdisciplinary/interdisciplinary units to incorporate inquiry into multiple perspectives, diverse cultures, and global issues.

EU3 S1 Consult academic texts or journals to read current research on designing instruction (i1A) (IB)

EU 3 S2 Incorporate research and evidence-based practices into the design of instruction (e.g. UbD, IB, SIOP and UDL). (e2K, i1A) (IB)

EU3 S3 Use standards-based curriculum maps (e.g. UbD) to design units and lessons to meet the needs of diverse learners. (c2J, c2B) (IB)

EU 3 S8 Select relevant instructional content, materials, resources and strategies for differentiated, universally designed instruction and sheltered instruction. (c2J, e2G) (IB)

EU6 S1 Integrate connections between their content area and the other content areas. (b2F, c2E) (IB)

EU6 S2 Use students’ prior knowledge and experience to introduce new subject-area related content. (a2B, b1G, c2D) (IB)

EU6 S5 Create and select activities that are designed to help students develop as independent learners and complex problem-solvers. (a1B, e2A, e2D) (IB)

EU6 S6 Evaluate, select, and integrate a variety of research-based strategies such as inquiry, cooperative learning, discussion, discovery, problem-based learning, and direct instruction into a coherent lesson design. (c2J, e2A, i1A) (IB)

EU6 S7 Make developmentally appropriate choices in selecting teaching strategies to assist diverse learners in meeting instructional strategies. (a2C, b1E) (IB)

EU6 S8 Use effective co-planning and co-teaching techniques to deliver instruction to all students. (c2J, e2I, h2E) (IB)

EU6 S9 Demonstrate the ability to recognize and value student diversity and the differences in how students learn and provide instruction to accommodate such diversity. (a1A, a2A, b2E, b1E, c2J, e2E) (IB)

EU6 S10 Use questions and questioning to assist all students in developing skills and strategies in critical and high-order thinking, inquiry, and problem solving. (b2C) (IB)
**EU6 S11** Use resources and multiple representations of content effectively, including technology, to enhance student learning. (b2A, b2B, b2D, b2E, b2G) (IB)

**EU6 S12** Reflect and analyze past lessons to improve in the future. (i2C) (IB)

**EU11 S2** Plan instruction to support students’ structured inquiry into global issues to inspire inter-cultural awareness and international mindedness. (b2C) (IB)

**EU11 S6** Collaborate to build and sustain a classroom and school environment that incorporates and values cultural, inter-cultural, linguistic and global diversity and issues. (a2D, g2D, h2A) (IB)

**EU11 S7** Engage in different ways of knowing within or across various disciplines. (b2B) (IB)

**Dispositions**

Each sequence and module in the Teaching and Learning with Schools and Communities Program (TLSC) focuses on several professional dispositions. Candidates are offered opportunities to receive feedback on their dispositional growth. The teacher candidate commits to appropriate professional and interpersonal behaviors in this module by:

**420 Dispositions Assessment:**

- D7 valuing the unique identities and backgrounds of all students, families and communities as essential assets in learning environments.
- D9 recognizing his/her own point of view and biases about diverse learners and how this perspective can impact teaching and learning.
- D13 acknowledging one’s ability to influence the motivation and achievement of students and to attain positive learning results using his/her personal and professional capacities. (d.1.D)
- D16 Valuing and promoting curiosity and creativity in students.

**421 Dispositions Assessment:**

- D4 demonstrating professionalism and reflective practice in collaborating with teachers, students, administrators, families, and communities to improve achievement for all students. (9N) (IB)
- D5 participating in ongoing professional development, reading, and research in order to deepen their knowledge and expand their repertoire of skills. (9O) (IB)
- D7 valuing and utilizing the unique identities and backgrounds of all students, families and communities as essential assets in learning environments. (9L, 9N) (IB)
- D9 demonstrating that authentic literacy instruction is the responsibility of all teachers, across all disciplines and grade levels. (2H, 6A) (IB)
- D15 valuing and promoting curiosity, creativity, and life-long learning in students. (IB)

**422 Dispositions Assessment:**

- D4 Demonstrating professionalism and reflective practice in collaborating with teachers, students, administrators, families, and communities to improve achievement for all students.
- D5 Participating in ongoing professional development, reading, and research in order to deepen their knowledge and expand their repertoire of skills.
- D7 Valuing and utilizing the unique identities and backgrounds of all students, families and communities as essential assets in learning environments.
D9 Demonstrating that authentic literacy instruction is the responsibility of all teachers, across all disciplines and grade levels.

D15 Valuing and promoting curiosity, creativity, and life-long learning in students.

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**Sequence Four Professionalism and Participation Policies:**

It is expected that teacher candidates in Sequence Four schools and informal partner sites will demonstrate high levels of professionalism and responsibility in all aspects of their work in this sequence. In order to complete the module assessments and requirements in a satisfactory manner, candidates must be present for all sessions, while in the PK – 8 classrooms, sequence instructional sessions on campus and at informal partner sites. In the event of approved absences, candidates should contact their professors and school sites in the manner that is requested by the administration at the respective schools. The following guidelines for participation will be considered in the module grades.

**Professional Attitude and Demeanor Part I**
- 2-Always prompt and regularly attend sessions. (no absences or tardies)
- 1-Rarely late and regularly attend sessions (No more than 1 absence).
- 0- Often late and/or poor attendance at sessions (More than 2 absences).

**Professional Attitude and Demeanor Part II**
- 2-Always prepared for sessions with assignments and required materials.
- 1- Rarely unprepared for sessions with assignments and required materials.
- 0- Often unprepared for sessions with assignments and required materials.

**Level of Engagement in Class**
- 2-Always a willing participant. Contributes by taking initiative, offering ideas and asking questions in sessions, small groups and classroom sessions.
- 1- Often a willing participant. Contributes by taking initiative, offering ideas and asking questions in sessions, small groups or classroom sessions
- 0- Rarely a willing participant. Rarely contributes to sessions by taking initiative, offering ideas or asking questions.

**Integration of Readings into Classroom Participation**
- 2- Often cites from readings; use readings to support points.
- 1- Occasionally cites from readings; sometimes use readings to support points.
- 0- Rarely cite from readings; rarely use readings to support points.

**Listening Skills**
- 2- Listens when others talk, both in groups and in sessions. Incorporate or build off of the ideas of others.
- 1- Listens when others talk, both in groups and in sessions
- 0- Rarely listens when others talk, both in groups and in sessions.

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**Course Evaluation**

**Grading**
All assignments will be graded using the rubrics posted on Sakai and Livetext throughout the semester. Each assignment will be calculated into the total number of points for the course. The number of points earned will be divided by the number of points possible, and a letter grade will be assigned using the scale below.

**ALL ASSIGNMENTS MUST BE SUBMITTED THROUGH LIVETEXT**
Grading Scale:

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<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>93 - 100</td>
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<tr>
<td>A-</td>
<td>90 - 92</td>
</tr>
<tr>
<td>B+</td>
<td>87 - 89</td>
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<tr>
<td>B</td>
<td>83 - 86</td>
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<tr>
<td>C-</td>
<td>70 - 72</td>
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<tr>
<td>D</td>
<td>61 - 69</td>
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<tr>
<td>F</td>
<td>60 - 0</td>
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Sequence Four Summative Assessment:

Throughout the semester, teacher candidates will engage in a structured interdisciplinary inquiry with specific connections to mathematics, and science and civic issues. Teacher candidates will have the opportunity to engage in both scientific and historical inquiry, while utilizing relevant mathematical practices. This structured inquiry will highlight common themes between the disciplines of math, science and social studies that have local, national and global connections. It should also serve as a model for what teacher candidates will design later for their own students in Sequence 6.

Candidates will choose a topic of interest and importance to them to investigate. They will use the inquiry-based approaches of Sequence 4 to investigate their particular issue of scientific and civic import, and they will pull on a range of mathematic practices. The goal of this assessment is to demonstrate a strong command of the content areas of science and social studies and the core practices of mathematics.

Assignments and readings are due on the dates listed on the course syllabi unless permission to hand them in late is given. Conflicts with an assignment deadline should be discussed and resolved prior to the assignment’s due date. Late work will only be accepted under special circumstances (e.g., family emergency, illness). Please contact your professor in person or by phone or email prior to any given due date to discuss assignment extensions requests. Failure to do so in a timely manner will result in significant grade deductions. **Computer or technical problems are not an acceptable excuse for late work.**

Unless otherwise noted, all assignments must be typed. Please double-space your work and use 12 point font. Attend closely and carefully to spelling and grammar. If referencing course or other textual materials, please follow American Psychological Association style guidelines (APA – 6th edition). You can access the APA style manual through Loyola University Chicago’s libraries or online at [http://www.apastyle.org](http://www.apastyle.org).

Also, as a reminder, all assignments in this course will be submitted via LiveText. Please make certain you have activated your LiveText account if you have not already done so.
**TLSC 420 Assignments**
Greater detail and rubrics will be provided for all assignments on Sakai.

**Course Participation – 10%**
Candidates are expected to consistently and actively participate in all class activities in discussions. Since much of this module takes place in a school, candidates are expected to dress and act professionally. They must arrive on time and stay for the duration of the class session. Class sessions will build directly on assigned readings; candidates must come to class having read all assigned texts and articles.

**Weekly Course Reflections – 30%**
Candidates will reflect on or make sense of the experiences you have during this module. Each week, candidates will be asked to respond to broad questions or ideas and how they pertain to learning, doing and teaching mathematics.

**Weekly Assignments – 30%**
Candidates will design lessons and problem solving templates. Candidates will also complete problem sets each week.

**Sequence Four Summative Assessment – 20%**

**TLSC 421 Assignments**
Greater detail and rubrics will be provided for all assignments on Sakai.

**Course Participation – 10%**
I expect you will attend each class session and arrive on time. I expect you to make regular and thoughtful contributions to class activities, discussions, and group projects for your own learning and those of others. I also expect you to arrive prepared for class through careful reading and reflection and timely completion of assignments.

During each course session you will earn points for your participation. Lack of participation, late arrival, and lack of preparation will impact your earned points. You will not be able to earn participation points if absent.

**Science Talk – 25%**
This assignment will ask you to *formatively* assess your students on their understanding of specific science topics (connected to your inquiry project), the types of experiences or knowledge bases they draw upon to make sense of the world, and what they wonder about or have questions about in connection to science. This assignment is a great opportunity to learn about and from your students and think about how what they know and want to know can inform your science lessons/units.

**Inquiry Plan Defense – 25%**
A developmental step while working on the sequence four summative assessment is to develop and present a plan to your peers with the goal of getting productive feedback. The plan must include your researchable question, a rationale for how it addresses an issue of both scientific and civic importance and initial designs for data collection (including sources and modes of collection). The inquiry plan will be presented to peers and the course instructor to receive
constructive feedback regarding the feasibility of their investigation and discussion of other possible data or resources that might assist their investigation.

**Weekly Course Reflections – 20%**
This assignment will ask you to reflect on or make sense of the experiences you have during this module. Each week, you will be asked to respond to broad questions or ideas and how they pertain to learning, doing and teaching science.

**Sequence Four Summative Assessment – 20%**

**TLSC 422 Assignments**
Greater detail and rubrics will be provided for all assignments on Sakai.

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**Required Texts, Readings and Resources**

**420 Module Text Book**

**420 sources**

*Principals and Standards for School Mathematics* NCTM
*Common Core State Standards for Mathematics*

**421 Module Text Book**
***Note that this book is available for free download at [www.nap.edu](http://www.nap.edu)***

**421 Other Readings**
Additional required readings will be posted to Sakai throughout the module.

**422 Required Text**


**422 Other Readings**


School of Education & University Policies

Conceptual Framework
The School of Education at Loyola University Chicago, a Jesuit and Catholic urban university, supports the Jesuit ideal of knowledge in the service of humanity. We endeavor to advance professional education in the service of social justice, engaged with Chicago, the nation, and the world. To achieve this vision the School of Education participates in the discovery, development, demonstration, and dissemination of professional knowledge and practice within a context of ethics, service to others, and social justice. We fulfill this mission by preparing professionals to serve as teachers, administrators, psychologists, and researchers; by conducting research on issues of professional practice and social justice; and by partnering with schools and community agencies to enhance life-long learning in the Chicago area.

Core Assessment Requirement
While completing the modules in this sequence, teacher candidates will engage in a semi-structured interdisciplinary inquiry with specific connections to science and civic issues. This inquiry will highlight common themes between and across the disciplines of math, science and social studies that have local, national and global connections.

Diversity
We strive to facilitate an inclusive environment respectful of all cultures and people. This module calls on candidates to meet the needs of diverse learners, and to make diversity the substance of the content that they will teach. This will be demonstrated in their coursework and relationships with classmates and instructors as well as in emerging professional relationships and knowledge of professional planning and instruction with the administration, faculty, students and families at the school and informal site.

Please use the following link [http://luc.edu/education/syllabus-addendum/] to find university policies on:

- Academic Honesty
- Accessibility
- Conceptual Framework
- EthicsLine Reporting Hotline
- Electronic Communication Policies and Guidelines