College of Education & Human Development Mission Statement
The College of Education and Human Development is a world leader in discovering, creating, sharing, and applying principles and practices of multiculturalism and multidisciplinary scholarship to advance teaching and learning and to enhance the psychological, physical, and social development of children, youth, and adults across the lifespan in families, organizations, and communities.

Course Objectives: Conceptual Framework for P-12 Professional Education Programs
The central themes of the Conceptual Framework are:
1. Promoting inquiry, research, and reflection;
2. Honoring the diversity of our communities and learners; and
3. Fostering a commitment to lifelong learning and professional development.

The purpose of this course is to examine science teaching and help you inquire and reflect about your own teaching practice and its impact on you and your students. Throughout this course we will collaboratively inquire about teaching and learning, observe and analyze instruction, and reflect on your own and each others’ science teaching. Ultimately this course is designed to not only support you during the practicum experience, but also help you learn how to use various instructional techniques and methods, and to inquire and reflect upon your teaching during this semester and beyond.

Prerequisite: Must be enrolled as in the initial/additional licensure program in science education.

Course format will include: discussion of current literature in educational research, examination of case studies of practicing teachers, lesson plan design, and inquiry-based instruction.

Course Goals (Students will…)
1. Develop an understanding of research-based instructional methods.
2. Experience and implement inquiry-based instruction.
3. Develop an understanding of scientific literacy in secondary education.
4. Develop your own teaching philosophy.
5. Justify practices and provide reasons for pedagogical strategies.

Science Education: Curriculum and Instruction Statement
The science education initial licensure program at the University of Minnesota is designed to help you become an accomplished professional science educator. The program seeks to prepare inquiring, analytical, and reflective educators who can teach in the classroom and lead in the schools.
Course Expectations (Standards for External Review):

Minnesota Standards of Effective Practice for Beginning Teachers

The Minnesota Board of Teaching has mandated that all teacher education programs need to assess their pre-service teachers according to their actual performance based on a set of specific standards. In this performance based approach, rather than simply passing courses or writing quality essays, students in our programs need to demonstrate their knowledge, dispositions, and skills as effective pre-service teachers. The following are the standards adapted by the Teacher Education Council that have been used to develop performance assessment tasks in different foundations and methods courses. You will be evaluated for readiness to obtain licensure based on meeting the following ten standards.

**Standard 1 – Subject Matter.** The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.

**Standard 2 – Student Learning.** The teacher understands how students learn and develop, and can provide learning opportunities that support their intellectual, social and personal development.

**Standard 3 – Diverse Learners.** The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to learners from diverse cultural backgrounds and with exceptionalities.

**Standard 4 – Instructional Strategies.** The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.

**Standard 5 – Learning Environments.** The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive interaction, active engagement in learning, and self motivation.

**Standard 6 – Communication.** The teacher uses knowledge of effective verbal, nonverbal and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

**Standard 7 – Planning Instruction.** The teacher plans and manages instruction based upon knowledge of subject matter, students, the community, and curriculum goals.

**Standard 8 – Assessment.** The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the learner.

**Standard 9 – Reflection and Professional Development.** The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and action on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

**Standard 10 – Collaboration, Ethics, and Relationships.** The teacher communicates and interacts with school colleagues, parents/guardians, families, and the community to support students’ learning and well-being.

**Textbooks/ Materials/Fees:**
- Other course materials and readings will be available on Moodle and Course Reserves.
Grading in CI 5530 will be based upon the following six components; detailed information for each assignment is available on Moodle:

15% = **Journaling Assignments**: Due Dates noted below. Post to Moodle Forum. (BOT Standard 9)

25% = **Modified Cookbook Lab**: Due Thursday, July 18. Submit on Moodle. (BOT Standards 1,3,4,5,6,7,8)

15% = **Case Study Analyses/ Small Group Presentation**: Due Dates noted below. Presented in groups in class. (BOT Standards 1,2,4,9)

15% = **Discrepant Events**: Due Monday, July 22. Present in groups in class, submit on Moodle. (BOT Standards 1-8)

15% = **Teaching Philosophy**: Due Thursday, July 25. Submit on Moodle. (BOT Standards 1-10)

15% = **Class Participation**: It is expected that you will attend class and participate in class discussions and activities. Missing more than one class will result in a decrease in your grade by a full letter grade. Some in-class assignments will be collected and included as part of your participation grade. (BOT Standards 1-10)

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**Course Outline and Schedule for CI 5530**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic/ Activities</th>
<th>Assignment</th>
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</thead>
</table>
| July 8, 2013 Monday | Week 1 Focus: What is Inquiry?  
Introductions/ Course Syllabus  
Small Group Discussions  
Becoming a Science Teacher  
Instructional Theory | Read: Chapters 1, 2, 3 & 5 this week.                                      |
| July 9 - Tu  | Conceptual Change  
A Private Universe | Journaling #1 on TBD Due by 11:59pm                                         |
| July 10 - W  | Scientific Literacy  
Goals of Science Teaching  
Case Study Discussed | Become familiar with:  
MN Science Standards, Next Generation Science Standards, National Science Education Standards, Benchmarks for Science Literacy – links on Moodle |
| July 11 - Th | Lesson Plans:  
Writing Learning Objectives  
Instructional Approaches  
Case Study | Group 1 Case Study due  
Journaling #2 Due by 11:59pm  
| July 15 - M  | Week 2 Focus: How to Implement Inquiry  
Inquiry-based Instruction  
Exhibit Stations: Neuroscience and Teaching  
Introduction to Modified Cook Book Labs | Read: Chapters 4, 6, 7, 8 this week.  
| July 16 - Tu | Inquiry-based Instruction and the Nature of Science (NOS)  
Case Study  
Introduction to Discrepant Events | Group 2 Case Study due  
Journaling #3 Due by 11:59pm  
| July 17 - W | Inquiry-based Instruction | Modified Cookbook lab due  
| July 18 - Th | Inquiry-based Instruction  
Case Study  
Introduction to Teaching Philosophy | Group 3 Case Study due  
Journaling #4 Due by 11:59pm  
| July 22- M | **Week 3 Focus: Inquiry as Theme (not just a daily activity)**  
Science Lab Safety  
Discrepant Events | Discrepant Events due  
Read: Chapters 9, 10, 11 this week.  
Read: Budd Rowe (1974)  
| July 23 - Tu | Problem Solving/Leading Discussion/Questioning Techniques  
Case Study | Group 4 Case Study due  
Journaling #5 Due by 11:59pm (Last one!)  
| July 24- W | Inquiry Lab Wrap Up  
Assessing Student Learning  
Managing the Inquiry Classroom  
Expectations for Fall and Spring Student Teaching… or where we’ve been and where we’re going. |  
| July 25- Th | Sharing Teaching Philosophies: Comments for improvements  
Inquiry Revisited: Your rationale  
Reflection: Revisit your blog posts | Teaching Philosophy due – on Moodle and bring two copies to class  
(resubmissions due by midnight tonight)  

**Technology**

Students in this course will need to have access to university e-mail, as some assignments will be turned in electronically. Course assignments, updated syllabi, & readings will be available through Moodle. Students will also explore instructional technology and web-based technology that supports science instruction. Visit our Course Reserves page by accessing this page: [https://rd.lib.umn.edu/](https://rd.lib.umn.edu/)

**Accessing Moodle and Journaling:**

To find the course website visit [http://www1.umn.edu/current-students/](http://www1.umn.edu/current-students/) log into MyU and go to “My Courses”. You will be asked to sign in using your University ID and password. You will need to make sure your browser is properly configured to use Moodle.

**Diversity**

Preparing educators to work with diverse student populations is an important part of this course. Consideration of diversity is found throughout the readings in this course and will be explicitly addressed in Moodle course website postings and the portfolio. I’ll keep an open mind if you will too.

**Disability**

The University of Minnesota is committed to providing all students equal access to learning opportunities. Disability Services is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations. Student registered with Disability Services, who have a letter requesting accommodations, are encouraged to contact the instructor early in the semester. Students who have, or think they may have a disability (e.g. psychiatric, attential, learning, vision, hearing, physical, or systemic), are invited to contact Disability Services for a confidential discussion at 612-626-1333 (V/TYY) or ds@umn.edu. Additional information is available at the DS website [http://ds.umn.edu](http://ds.umn.edu).
Participation
Attendance is essential in order to experience the practical and social nature of science teaching in schools. Reflection of your learning and peers is critical to the success of this course. Illness or other emergencies may prevent you from attending classes. If you miss one of the class sessions, the highest grade you can receive is a B. If you miss three of the class sessions, the highest grade you can receive is a C. Please email me, if you are unable to attend a session.

Late Work
All late assignments will be reduced one letter grade for every day late. For example if the assignment was due on Monday and turned in on Wednesday, the assignment will be reduced two letter grades. Grades will not be reduced more than 50%; however, no work will be accepted if it is over one week late. Extensions by the course instructor are only granted in writing for extenuating medical or family problems. Extensions will be granted when a medical doctor provides written documentation. If you do NOT have an extension granted in writing by the instructor, the late assignment will be marked down accordingly.

Incompletes
Incompletes are highly discouraged but may be granted under extenuating circumstances such as family medical problems or illness. Incompletes are only granted in writing and will involve a written agreement with a specified completion date. Incompletes in CI 5530 must be made up by September 1, 2013 or the student will not be able to take CI 5531 or do practicum teaching.

University of Minnesota Policy on Sexual Misconduct
University policy prohibits sexual harassment as defined in the 1998 policy statement. Copies of the policy statement on sexual harassment are available at 419 Morrill Hall. Complaints about sexual harassment should be reported to the University Office of Equal Opportunity at 419 Morrill Hall.

University of Minnesota Policy on Scholastic Misconduct
Scholastic misconduct is broadly defined as any act that violates the rights of another student in academic work or that involves misrepresentation of your own work." Scholastic dishonesty includes, (but is not necessarily limited to): cheating on assignments or examinations; plagiarizing, which means misrepresenting as your own work any part of work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of all instructors concerned; depriving another student of necessary course materials; or interfering with another student's work.

Support Services
During the semester we will be engaged in writing several times. Students who are interested in receiving assistance with their writing may receive help through the following University services: The Center for Writing 227 Lind Hall 612 626-7579. Offers all University of Minnesota students free, individualized writing instruction. The Department of Rhetoric's Online Writing Center http://www.owc.umn.edu/ Provides personalized online tutoring, a grammar hotline, and support for distance learners, especially in science and tech writing.

How to Access Your Grades
Grades will be distributed in class and available from your supervisor. End of the term grades are available on OneStop for Students (http://onestop.umn.edu/Student/), click on Grades & Transcripts, then click on View or Print your Unofficial Transcript.)

The University of Minnesota is an equal opportunity employer and educator.
Grading:
Final Grades will be determined using the following scales. The numbers represent percentages of possible points earned. Grades will be rounded to the nearest integer.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100-94</td>
<td>Achievement that is outstanding relative to the level necessary to meet course requirements</td>
</tr>
<tr>
<td>A-</td>
<td>93-90</td>
<td>Achievement that is outstanding relative to the level necessary to meet course requirements</td>
</tr>
<tr>
<td>B+</td>
<td>89-87</td>
<td>Achievement that is significantly above the level necessary to meet course requirements</td>
</tr>
<tr>
<td>B</td>
<td>86-84</td>
<td>Achievement that is significantly above the level necessary to meet course requirements</td>
</tr>
<tr>
<td>C+</td>
<td>79-77</td>
<td>Achievement that meets the course requirements in every respect</td>
</tr>
<tr>
<td>C</td>
<td>76-74</td>
<td>Achievement that meets the course requirements in every respect</td>
</tr>
<tr>
<td>C-</td>
<td>73-70</td>
<td>Achievement that meets the course requirements in every respect</td>
</tr>
<tr>
<td>D+</td>
<td>69-67</td>
<td>Achievement that is worthy of credit even though it fails to meet fully the course requirements</td>
</tr>
<tr>
<td>D</td>
<td>66-64</td>
<td>Achievement that is worthy of credit even though it fails to meet fully the course requirements</td>
</tr>
<tr>
<td>D-</td>
<td>63-60</td>
<td>Achievement that is worthy of credit even though it fails to meet fully the course requirements</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60</td>
<td>Achievement that is worthy of credit even though it fails to meet fully the course requirements</td>
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Science Education Resources Used to Prepare for this Course:


**Online Resources:**

Minnesota State Science Standards:  

Next Generation Science Standards  

Nationals Science Education Standards  

Benchmarks for Science Literacy  