

**Science Teaching Methods 2 - Teaching of Biological and Physical Sciences**  
BIOS 403/CHEM 495/ENVS 495/GEOL 495/PHYS 495

Fall 2016

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**Text:** None

**Course description:** This course is preparation for teacher licensure in grades 6-12 in one or more of the fields of physical or life science: biology, physics, chemistry, earth science, environmental science, or general science. The course includes examination and analysis of modern curricula, classroom and laboratory organization, lesson planning, multicultural education, teaching science to the exceptional child, reading and the teaching of science, and methods of evaluation.

**Course objectives:**

1. **SHARE A PHILOSOPHY OF SCIENCE EDUCATION:** The student will discuss their philosophy of education including their views about teaching controversial topics, in a general high school/middle school science class.
2. **THE SCIENCE CLASSROOM:** The student will (1) describe how they would construct a learning environment for a laboratory based science classroom, which non-verbally transmits course objectives and instructional intent, just by entering the room and (2) develop a set of classroom guidelines, including discipline strategies and a comprehensive classroom safety plan.
3. **GOALS AND OBJECTIVES:** The student will develop his/her own core subject goals and objectives for a one year long course in the life sciences or physical sciences at the high school/middle school level. In this process, students will become aware of both national and state standards for science education and demonstrate their ability to effectively address these standards in their teaching.
4. **LESSON PLAN DEVELOPMENT:** The student will demonstrate the ability to develop lesson plans that incorporate use of a variety of hand-on/minds-on instructional activities appropriate for the teaching of the life sciences or physical sciences. In this process, students will become aware of both national and state standards for science education and demonstrate their ability to effectively address these standards in their teaching.
5. **DESIGN A UNIT:** The student will develop a syllabus for teaching a typical unit for a high school/middle school course in the life sciences or physical sciences. In addition, the student will construct combined formal and informal assessments as part of the evaluation process for the class. In this process, students will become aware of both national and state standards for science education and demonstrate the ability to effectively address these standards in their teaching.

6. **PRESENT LESSONS:** The student will plan and deliver in an appropriate manner, a series of lessons. The details of which will be discussed during class in the near future.

**Expectations:** We will set a standard of professional behavior, including attendance, dress, participation, courtesy, and the submission of assignments by the due date are both expected and **required**. Professional demeanor, of the type that we expect in the educational workplace, is required at all times in this course. Please silence your cell phone and other electronic devices during class. If you need to check your phone, please do that during a break outside of the classroom.

**Attendance:** You are expected to attend every class, arrive to class on time, and remain for the duration. In case of emergency, please notify all instructors in writing (email is fine) with as much advance notice as possible. Failure to notify the instructors in writing of an absence will be regarded as an unexcused absence and **there will be no make-up assignments, quizzes, or tests.**

In addition, for each class missed, you will receive a 5% penalty on your overall course grade. For example, if you miss four classes, there will be a 20% penalty and your maximum possible grade will be 80% (assuming you get perfect scores on all assignments).

**Assignments:** You will be expected to complete a number of assignments throughout the semester. The assignments have clear deadlines and must be handed in on time and by the start of class. Assignments turned in **within two days of the deadline will receive half credit**. Assignments submitted after two days will not be accepted and a zero will be recorded in the grade book. Successful completion of certain assignments is required to pass the course. **The teacher licensure program is a standards-based program. You MUST show competency in the following standards before progressing in the licensure program. Competency is a grade of C (70%) or better.**

- Safety survey
- All unit plan calendars and lesson plans
- All teaching demos

## Course Schedule

*This schedule is tentative and subject to change.*

<b>Date</b>	<b>Class Topics</b>	<b>Assignments Due</b>	<b>Readings Due</b>
<b>Week 1</b> Aug 25	Course intro, Topic Sequence <i>What are you teaching?</i>		
<b>Week 2</b> Sep 1	<i>How do students learn science?</i> Inquiry Readings Model Inquiry Activities	- Content area topic sequencing assignment due	Inquiry reading
<b>Week 3</b> Sep 8	<i>How will you know?</i> Assessment	- Unit plan calendar 1 and NGSS lesson plan 1 due	
<b>Week 4</b> Sep 15	<i>How do students do science?</i> Argumentation, Peer Review	-Assessment assignment	
<b>Week 5</b> Sep 22	Preconceptions and Misconceptions	-Safety survey due -Revised unit plan calendar 1 and NGSS lesson plan 1 due	Misconception reading
<b>Week 6</b> Sep 29	Fire safety, Vernier probes, Activities w/probes	-Unit plan calendar 2 and inquiry lesson plan 2 due	
<b>Week 7</b> Oct 6	Lesson presentations	- Revised unit plan calendar 2 and inquiry lesson plan 2 due 1 week prior to demo - Self-reflection due one week after teaching demo	Readings TBA

<b>Week 8</b> Oct 13	Lesson presentations	-Unit plan calendar 3 and lesson plan 3 due 1 week prior to demo - Self-reflection due one week after teaching demo	Readings TBA
<b>Week 9</b> Oct 20	Lesson presentations		Readings TBA
<b>Week 10</b> Oct 27	Lesson presentations		Readings TBA
<b>Week 11</b> Nov 3	Lesson presentations		Readings TBA
<b>Week 12</b> Nov 10	Lesson presentations		Readings TBA
<b>Week 13</b> Nov 17	Lesson presentations		Readings TBA
<b>Week 14</b> Nov 24	<i>No class - Thanksgiving</i>		
<b>Week 15</b> Dec 1	Lesson presentations		Readings TBA
<b>Finals Week</b> Dec 8	<i>Finals Week</i> Lesson presentations		

## Course Grades

### ASSIGNMENTS, POINT VALUES AND DUE DATES

*This list is tentative and is subject to change.*

Assignment	Point Value	Due Date
Topic sequencing assignment	25	Sep 1
Unit plan calendar and NGSS lesson plan 1 draft	20	Sep 8
Assessment assignment	50	Sep 15
Safety survey	50	Sep 22
Revised unit plan calendar and NGSS lesson plan 1	100	Sep 22
Unit plan calendar and inquiry lesson plan 2 draft	20	Sep 29
Revised unit plan calendar and inquiry lesson plan 2	100	One week before demo
Inquiry lesson plan 2 teaching demo	50	TBA
Teaching demo self-reflection	25	One week after demo
Unit plan calendar and lesson plan 3	100	One week before demo
Lesson plan 3 teaching demo	50	TBA
Teaching demo self-reflection	25	One week after demo

Letter Grade	Percent
A	90-100
B	80-89
C	70-79
D	60-69
F	below 60

**Accessibility:** Northern Illinois University is committed to providing an accessible educational environment in collaboration with the Disability Resource Center (DRC). Any student requiring an academic accommodation due to a disability should let his or her faculty member know as soon as possible. Students who need academic accommodations based on the impact of a disability will be encouraged to contact the DRC if they have not done so already. The DRC is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or [drc@niu.edu](mailto:drc@niu.edu).

**Academic Integrity:** As detailed in the current NIU undergraduate catalog: *Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university.*

*A faculty member has original jurisdiction over any instances of academic misconduct that occur in a course which the faculty member is teaching. The student shall be given the opportunity to resolve the matter in meetings with the faculty member and the department chair. If the facts of the incident are not disputed by the student, the faculty member may elect to resolve the matter at that level by levying a sanction no greater than an F for that course. The faculty member shall notify the student in writing whenever such action is taken, and the **Office of Community Standards and Student Conduct** shall receive a copy of the Academic Misconduct Incident Report indicating final disposition of the case, which will be placed in the student's judicial file. In all matters where the charge of academic misconduct is disputed by the student or if the faculty member feels a sanction greater than an F in the course is appropriate (such as repeated offenses or flagrant violations), the faculty member shall refer the matter to the Office of Community Standards and Student Conduct making use of the Academic Misconduct Incident Report. Additional sanctions greater than an F in a course can be levied only through the University Judicial System. With regards to finding the student either responsible or not responsible for his or her action, the ruling of the Judicial Hearing Board shall be binding. In cases where there is either a finding of responsibility or an admission of responsibility by the student, any recommendations by the hearing board regarding the course grade are non-binding on the instructor, who remains solely responsible for assigning a course grade, consistent with the policies set forth in the course syllabus.*