



## **Next Generation Science Standards Series**

### **Understanding NGSS (K-12)**

**EDUO 9539** Two semester units/credits

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*\*This course is a prerequisite for the planning courses*

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### **Other Courses In the Next Generation Science Standards Series**

#### **Planning a NGSS Unit with a STEM Emphasis**

**EDUO 9540** One semester unit/credit

Instructors: Gina Bergskaug and John Boucher

*\*Understanding NGSS K-12 EDUO 9539 is a prerequisite for this course*

#### **Planning a NGSS Unit Emphasizing Math and ELA**

**EDUO 9541** One semester unit/credit

Instructors: Gina Bergskaug and John Boucher

*\*Understanding NGSS K-12 EDUO 9539 is a prerequisite for this course*

### **Course Description**

This class will explore the knowledge regarding the current K-12 science standards. Such knowledge will enable the teacher to plan a successful Next Generation Science Standard teaching unit.

### **Course Goals**

Upon completion of this class the teacher will:

- show understanding of the K-12 Next Generation Science Standards
- be able to plan meaningful NGSS teaching units for K-12 students

### **Course Objectives**

The teacher will show understanding of and ability to plan NGSS by:

1. explaining the NGSS to various people with different levels of understanding
2. using assorted media to convey the information
3. critiquing NGSS information
4. relating the information gleaned to the classroom

5. being aware that NGSS assessment can be tricky
6. summarizing the NGSS knowledge learned in this course

### Grading Rubric.

Exemplary: A+ to A-	Acceptable: B+ to B-	Unacceptable: Must be resubmitted
Responses are will organized with specific details excellently expressed and every requirement completed	Material is relevant as it connects to the each assignment	Ideas are not clear or relevant and not well organized
Shows ability to transform knowledge into very successful teaching lessons	Shows the ability to transform knowledge into the classroom	Shows little or no understanding of the how to transform knowledge into the classroom
Creatively and clearly summarized the knowledge learned	Summarized the knowledge learned	Few or no facts or specific details of the learned material

### Materials

The following eight website resources will be used in this course.

Websites #1 & 2 are for K-12

- 1) <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=OCDMQFjAC&url=http%3A%2F%2Fwww.nextgenscience.org%2Fsites%2Fngss%2Ffiles%2FNGSS%2520DCI%2520Combined%252011.6.13.pdf&ei=Q6KsVLjTN8jooASyxIGYCA&usg=AFQjCNFCZU3jqaE8HcwtPCSHV12XypDUg>
- 2) <http://www.nextgenscience.org/next-generation-science-standards>

Websites #3 & 4 are for elementary teachers

- 3) <http://elemngss.blogspot.com/>
- 4) <http://nstacomunities.org/blog/2014/09/09/how-can-elementary-teachers-work-toward-the-vision-of-the-next-generation-science-standards/>

Websites #5 & 6 are for secondary teachers

- 5) <http://www.nextgenscience.org/ngss-high-school-evidence-statements>
- 6) [http://www.ngsslifescience.com/biology\\_lesson\\_plans.html](http://www.ngsslifescience.com/biology_lesson_plans.html)

Websites #7 & 8 are for K-12

7) <http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/>

8. [http://www.ssec.si.edu/blog/science-assessment-the-next-generation#.VMlkjyyNi\\_h](http://www.ssec.si.edu/blog/science-assessment-the-next-generation#.VMlkjyyNi_h)

## Assignments

### A) Demonstrate your understanding

*After reading and studying website 1, respond to A1 – 8*

1) <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CDMQFjAC&url=http%3A%2F%2Fwww.nextgenscience.org%2Fsites%2Fngss%2Ffiles%2FNGSS%2520DCI%2520Combined%252011.6.13.pdf&ei=Q6KsVLjTN8jooASyxIGYCA&usg=AFQjCNFCZU3jqaE8HcwtpCS-HV12XypDUg>

- Scroll down and find the grade storyline for the level that you teach. Study the storyline. To show your understanding, relate the material to the following three people in a manner appropriate for them.
  - A1.** a student in your class
  - A2.** a parent of a student in your class
  - A3.** an administrator in your school
- The NGSS for your grade level are explained after the storyline for your grade level. Study them and then select one and explain how you would create some type of classroom display to illustrate that NGSS.
  - A4.** the explanation of that classroom display
- You have written a book about how to teach one of the NGSS (but not the one in A4) and you have purchased an ad in EDWeek about that book. Sell the book by explaining the NGSS you have chosen to put in the book.
  - A5.** the advertisement
- You have just finished teaching a classroom lesson concerning yet another NGSS. You are very excited because of how well the lesson was received by the students. As soon as you arrive home you write an email to a very close friend telling them why you are so excited and explain what the lesson was about and how it unfolded.
  - A6.** the text of that email
- A7.** Choose a NGSS for your grade level that you are uneasy about teaching and tell why.

**A8.** How would you go about easing the anxiety of teaching the NGSS in **A7**?

*Read and study website #2*

#2 <http://www.nextgenscience.org/next-generation-science-standards>

- View the two videos – “NGSS Overview” and “Why NGSS”

**A9.** You have produced a video similar to the NGSS overview video.

What does your video look like?

**A10.** You have been asked to appear in the Why NGSS video. What will you say?

### **A11(E)- 17(E) are for Elementary Teachers only**

**A11(E).** Critique the lesson on Mud & Sticks in website #3 regarding its appeal to primary teachers.

#3 <http://elemngss.blogspot.com/>

**A12(E).** Explain what the “The Sword of Damocles” has to do with elementary school science assessment.

**A13(E).** Which of the following were the most relevant to you and why?

- Spatial Opportunity
- Coming to a classroom near you
- Look back on two weeks of curriculum writing
- How far does 2100 minutes go
- Look back after one week of curriculum development

**Website #4 shows how a teacher can rope together disciplinary core ideas, crosscutting concepts, and science and engineering practices.**

#4 <http://nstacommunities.org/blog/2014/09/09/how-can-elementary-teachers-work-toward-the-vision-of-the-next-generation-science-standards/>

**Click on** the three links (disciplinary core ideas, crosscutting concepts & science and engineering practices) and explain each in A15 -17

**A14(E).** disciplinary core ideas

**A15(E).** crosscutting concepts

**A16(E).** science and engineering practices

**A17(E).** What lesson(s) in website #4 could best be accomplished at your grade level- Explain.

## **A11(S) – A17(S) are for Secondary Teachers only**

Read and study Website #5 and then respond to A11(S) – A14(S)

#5 <http://www.nextgenscience.org/ngss-high-school-evidence-statements>

Choose one lesson that you would like to teach in the four categories listed on the website and state your reasons for this choice.

**A11(S).** physical science

**A12(S).** life science

**A13(S).** earth & space science

**A14(S).** engineering, technology & application science

Read and study website #6 and respond to A15(S) – A17(S)

#6. [http://www.ngsslifescience.com/biology\\_lesson\\_plans.html](http://www.ngsslifescience.com/biology_lesson_plans.html)

Scroll down until you find lesson plans by subject. Look them over and choose three that you would like to teach and tell why

**A15(S).** Plan 1

**A16(S).** Plan 2

**A17(S).** Plan 3

## **For all teachers**

- *Read and study website #8*

#8. <http://www.ssec.si.edu/blog/science-assessment-the-next-generation#.VKzSgHv5w20>

**A18.** Discuss problems for teachers in assessing the NGSS.

*Look over website #7*

<http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/>

**A19.** Choose a lesson from website #7 for your grade level and develop assessment techniques for that lesson.

## **B Summary**

You have now been recognized as an expert on understanding and explaining the Next Generation Science Standards. Because of this your principal has asked you to address the local service club that partners with your school. You have enthusiastically accepted and have prepared a speech that highlights what you have learned in this class.

**B1.** compose the introduction

**B2.** outline the body

**B3.** write out the conclusion