



ISTS Professional Development Syllabus

Course Name: 2021 Iowa Science Teaching Section Conference

Course Credit: 1 ISEA License Renewal Credit or 1 Drake University Graduate Credit (30 hours additional course time required for Drake Graduate Credit with the 15 hours Required for ISEA License Renewal Credit)

Course Cost: \$25 ISEA License Renewal or \$90 for Drake University Graduate Credit

Instructor(s)/Contact Information: Jesse Wilcox, Ph.D., jesse.wilcox@uni.edu or 515-450-2759

Published Description of Course:

The purpose of this course is to take your learning from the Iowa Science Teaching Section Conference directly into your classroom setting. An emphasis of the assignments will be to make your science classroom more equitable.

Required Text: None. Readings for the reading assignment can be found below.

Objectives/Standards for the Class:

Students will:

1. Engage in professional development activities at the Iowa Science Teaching Section Conference
2. Engage in reflective practice focused on improvement.
3. Apply learning from the ISTS conference/course materials to improving science teaching.
4. Demonstrate an accurate understanding of equity in PK-12 science.
5. Express best practices in engaging students with real-world experiences (e.g., community, inquiry).

Participant Evaluation:

Grade	Standards
A/Pass Grade	Met all 5 course standards
B/Pass Grade	Met 4 course standards
C/Fail Grade	Met 3 course standards
D/Fail Grade	Met 2 course standards
F/Fail Grade	Met 1 or 0 course standards

Assignments

Required Assignment (15 hours)

- Attend the ISTS Conference on October 4th. (8 hours)
- Attend the ISTS Conference on October 3rd at the Science Center of Iowa in Des Moines. (3 hours)
- Attend Zoom sessions and virtual discussions (4 hours)
- Select optional assignments listed below to equal required assignment time for credit preference.

Optional Assignments

You can choose which assignments you would like to complete. However, assignments must add to 15 hours Instructor-Led for ISEA Credit or 30 hours for Drake Credit including the required assignments. Time requirements are on each assignment. Regardless of which assignments you choose, be sure you are addressing all 5 standards (see above).

- **ISTS Conference Review (2 hours)**
 - Write a list of the sessions you attended.
 - For each session, write a short evaluation including what went well, what could be improved, and how relevant the session was to your teaching practice.
 - What aspects of the conference did you find valuable?
 - What could ISTS do to improve the conference?
 - How do you think ISTS could recruit more PK-College science teachers and science teaching stakeholders?
 - Receive instructor feedback.
- **Lesson Modification Assignment (4 hours)**
 - Find an activity that is suited for your grade level and setting. You can use something you've done in the past. Using what you have learned at this conference, modify this activity so it is more engaging and equitable for your students. Ensure that your content is developmentally appropriate, is engaging, and considers students' prior knowledge.
 - Turn in the original activity, the modified version, and a short explanation that provides your rationale for the changes that you made. The rationale should be consistent with effective science teaching practices.
 - Receive instructor feedback.
- **NGSS Learning Cycle/5E Planning Task (6 hours)**
 - Select a standard from the Next Generation Science Standards that aligns to your grade level/subject area. Your task will be to create an engaging learning cycle or 5E lesson plan that you believe aligns to the standard. You will then answer some questions that are on the task that help us know how you might implement the lesson with your kids.
 - Questions
 - How will you engage your students?
 - How will you know if students understand?
 - How will you ensure your lesson is equitable?
 - Receive instructor feedback

- **Research Topic Investigation (8 hours)**
 - Select a topic you learned about at ISTS (e.g., equity, inquiry). Use Google Scholar to find at least 5 research articles related to that topic. Then, write a summary of the research and how that research will be applied to your classroom.

- **Self-analysis of Teaching (8 hours)**
 - While teaching, record your science lesson. Watch your video and analyze your teaching with specific attention to your questions and interactions patterns with students. Please note that this is not simply a personal reflection of the lesson taught—it is a systematic evaluation of the interactions you have with your students. You will write a paper (typically 3- 5 pages) that includes the following:
 - 1) **What Should I Be Doing?** Accurately describe effectively interacting with students. You can use the readings from the reading/reflection assignment, your own prior knowledge, and what you learned at ISTS to inform this section.
 - 2) **What I am doing?** Accurately describe your interactions with students.
 - 3) **How can I bridge the gap?** Compare what you are doing with what you want to be doing. Write a reflection that includes:
 - What is going well in your classroom?
 - How can you make your interactions with students more equitable?
 - What recommendations do you have for yourself?
 - What concrete strategies could you use to move your teaching forward?
 - Receive instructor feedback.

- **Readings and Reflections (10 hours)**
 - **The following readings are tied to one or more of the conference themes. Please read the following readings and answer the questions.**
 - Readings
 - [Ashbrook, P. \(2019, August 10\).](#) Partnering with Community Organizations to Support Science Learning: Research-based tips for forming partnerships. NSTA.
 - [Bergman, D. J. \(2018\).](#) “I Think You Mean...” Potential Perils of Teacher Paraphrasing and Alternative Responses for Student Engagement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 1-11.
 - [Derry, S. & Wilcox, J. \(2021\).](#) Growing STEM in the Community: Planning a STEM Festival. *The Elementary STEM Journal*. 25(3), 9-15.
 - [Emdin, C. \(2008\).](#) The three C's for urban science education. *Phi Delta Kappan*, 89(10), 772-775.
 - [Emdin, C. \(2020, July 24\).](#) *Teaching Isn't About Managing Behavior: It's about reaching students where they really are.* The Atlantic.
 - [Mensah, F. M. \(2021\).](#) Culturally Relevant and Culturally Responsive. *Science and Children*, 58(4).
 - [Wilcox, J., Kruse, J.W. & Clough, M.P. \(2015\).](#) Teaching Science through Inquiry: Seven common myths about this time-honored approach. *The Science Teacher*, 82 (6), 62-67.

- Questions
 - What do you think was the big idea/s in the article?
 - How well do you think you implement these ideas in your classroom?
 - How could you improve implementation of these ideas?
 - In your opinion, why is creating an equitable environment crucial for PK-12 science?
 - What are some specific culturally relevant/culturally responsive practices you could use?
 - What might be the value in creating community partners?
 - What are some effective ways to engage students in conversation?
 - How can you effectively respond to students?
 - Why is teaching science through inquiry effective?

Estimated Learning Time

Required Activity (15 hours)

Activity	Time
ISTS Sessions- October 3 rd at the Science Center of Iowa in Des Moines, Iowa	3 hours (Required)
ISTS Sessions (Required)- October 4 th at the FFA Enrichment Center in Ankeny, Iowa	8 hours (Required)
Zoom sessions and virtual discussions	4 hours (Required)

Additional Activity Options

Your activities must add to 15 hours for ISEA and 30 hours for Drake in addition to the 11 hours of the ISTS Conference and 4 hours of Zoom sessions and virtual discussions.

Additional Activity Options	Time
ISTS Conference Review	2 hours
Lesson Modification Plan	4 hours
NGSS Planning Task	6 hours
Research Topic Investigation	8 hours
Self-analysis of Teaching	8 hours
Readings and Reflections	10 hours