



SCE 4863
Science, Technology, Society Interaction
83723 001
Fall 2026

Instructor Name

Stephanie Arthur

University Course Description

Achieve a historical and philosophical understanding of (1) the nature of the scientific enterprise: interaction of science, technology, and society (STS), (2) how to teach STS, including the use of computers and related technologies, and (3) intricacies of sample STS topics.

Course Requisites

Prerequisite(s):

Corequisite(s):

Course Format

The course is fully in-person and meets Mondays from 5pm to 7:45pm in EDU 313.

Student Learning Outcomes

By the end of this course, students will demonstrate their learning by:

1. Analyzing and critiquing a science activity or curriculum for its treatment of science content, process skills, the nature of science, and the inclusion of learners' perspectives,

- and proposing specific, well-justified adaptations.
2. Designing an integrated STS-SSI unit plan built around an ill-structured, controversial, and personally relevant socioscientific issue, with aligned goals, objectives, instruction, and standards.
 3. Justifying instructional decisions by drawing on constructivist learning theory and the goals of scientific and functional scientific literacy.
 4. Constructing evidence-based arguments during class seminars, supporting claims with readings and reasoning while engaging respectfully with multiple and dissenting perspectives.
 5. Evaluating socioscientific issues for their key science concepts, required process skills, and ethical and moral dimensions, and distinguishing SSI from a traditional STS approach.
 6. Incorporating informal science education experiences, such as field trips and community resources, into purposeful, standards-connected science instruction.
 7. Presenting and defending a unit plan to peers, communicating instructional rationale clearly and responding thoughtfully to questions.
 8. Reflecting on readings, discussions, and activities to articulate growth in their own developing practice as an effective science teacher.

Course Objectives

Upon successful completion of this course, students will be able to:

1. Explain the meaning and importance of scientific literacy and functional scientific literacy as a goal of science education.
2. Describe the history, rationale, and defining features of the Science/Technology/Society (STS) approach, and distinguish it from traditional, content-driven science instruction.
3. Connect constructivist learning theory to science teaching, explaining how students construct understanding and why this matters for instructional decisions.
4. Distinguish socioscientific issues (SSI) from STS, and analyze the science concepts, process skills, and moral and ethical reasoning that SSI instruction requires.
5. Critically evaluate and adapt science activities and curricula with attention to science content, process skills, the nature of science, and the perspectives and needs of diverse learners.
6. Apply strategies for making science accessible and engaging for all learners, including students of varying abilities, backgrounds, and learning profiles.
7. Incorporate informal science education experiences such as field trips and community resources into science teaching in purposeful, standards-connected ways.
8. Design an integrated STS-SSI unit plan anchored in an ill-structured, controversial, and personally relevant issue and aligned with professional, state, and/or national standards (e.g., Florida State Standards, NGSS).
9. Engage in evidence-based professional discourse, supporting claims with readings, examples, and reasoning while respecting multiple perspectives.
10. Reflect on readings, discussions, and activities to articulate how course experiences inform the developing practice as an effective science teacher.

Required Texts and/or Readings and Course Materials

There is no textbook for this course. All articles and resources for the Course will be made available in Canvas.

IMPORTANT: It is expected that you read assigned resources *before* class to prepare for class discussions and subsequent reflections on them.

How to Succeed in this Course

The purpose of this fully in-person course is to help you develop skills as an effective science teacher. The expectation is that you will fully participate in the course in a purposeful and professional manner. Your assignments should be completed in a thoughtful way, taking care to reflect on how they help you to develop your craft as a science teacher. Success in this course is dependent upon active weekly participation and completing all assignments with care, thoughtfulness, and thoroughness.

Grading Scale

Final grades will be calculated based on the percentage of points accumulated by the students compared to the total number of points.

Grading Scale (%)

90-100 A

80 - 89 B

70 - 79 C

60 - 69 D

0 - 59 F

Grade Categories and Weights

Weighted assignments are as follows:

- **5% Reflection**
 - Submitted online- educational and career goals ~ what has motivated you to become a teacher.
- **30% Contribution to class seminars and completion of in-class assignments**
 - Classroom discussions of readings and exercises. (See Classroom Discussions Rubric below).
- **25% Class Reflections-** After each class session, you will write a reflection of what you learned in class, from the articles, class discussions, and activities, and explain why these are important in helping you to become an effective science teacher and how this will help your students to succeed.
- **30% Final Project**
- **10% Presentation and Dissemination of Project to Class**

Note: Written assignments are expected to adhere to the guidelines of the American Psychological Association (**APA 7**). Please submit your written assignment in Microsoft Word.

Class Discussions:

Students are expected to have completed the identified readings and exercises on the dates indicated; be prepared so you can fully engage with your peers in professional discourse during class seminars.

Rubric for Evaluating Class Discussions

Criteria	Evidence
Criteria	Evidence
Focus	- Fully addresses the question / comment. - Stays with the topic. - Adds ideas that support the main idea of the question / topic.
Clarity	- Expresses ideas clearly. - Points flow logically. - Communicates meaning.
Supports for Ideas	- Makes points and supports them with relevant examples, explanations, or evidence. - Uses analogies that help to support concepts. - Employs conceptual analyses to argue and add clarity. - Evokes claims backed by warrants.
Reference to Readings and Knowledge Base	- Demonstrates understanding of concepts by incorporating readings and reference(s) to appropriate knowledge base(s). - Adds to knowledge base with references to additional readings and relevant past experiences (tacit knowledge).
Consideration of Dissenting Viewpoints and Time	- Tolerates ambiguity of conflicting viewpoints. - Respects multicultural perspectives. - Yields to others in mutual discourse. - Demonstrates time management.

Major Topics and Course Schedule

Course Schedule (Tentative and subject to revision)

Week	Topic	Readings (to be read prior to class meeting)
------	-------	--

1 (8/24)	Introductions; syllabus; Scientific Literacy	Syllabus (read prior to class) Introduction – Putting Science Back in the Public Dialogue (document pp 6-9) Clough, G. W. (2011). <i>Increasing scientific literacy: A shared responsibility</i> . Smithsonian Institution.
2 (8/31)	Nature of Science, Science Technology and Society	<i>History & meaning of STS, misconceptions</i> Yager, R. E. (1996). History of science/technology/society as reform in the United States. In R. E. Yager (Ed.), <i>Science/technology/society as reform in science education</i> (pp. 3–15). State University of New York Press. Yager, R. E. (1996). Meaning of STS for science teachers. In R. E. Yager (Ed.), <i>Science/technology/society as reform in science education</i> (pp. 16–XX). State University of New York Press.
X (9/7)	Labor Day – No Class	--
3 (9/14)	STS, Constructivism & STS Processes in Learning	<i>Define Constructivism & how students make meaning; STS Approach & Constructivism</i> Ch 3 Lochhead, J., Yager, R.; Ch. 4 Lutz, M.
4 (9/21)	Functional Scientific Literacy; STS and Process Skills Enhancement	<i>How STS can enhance comprehension & creativity</i> Ch.6 Wilson, J., Livingston, S. Ch. 8 Penick, J.E.
5 (9/28)	Benefits of differentiating science teaching STS for all learners	<i>How STS can help students with learning exceptionalities and different needs & beliefs; science for all learners</i> Ch. 10 Olson, E., Iskandar, S. Ch. 11 Koch, J., Blunck, S.;
6 (10/5)	STS and SSI	<i>Beyond STS: A Research-based Framework for Socioscientific Issues Education</i> (Zeidler et. al, 2005)

7 (10/12)	Informal Science Education	Readings TBA
8 (10/19)	SSI/STS and AI Final project topic proposal due	Readings TBA
9 (10/26)	SSI/STS Environmental Science/Ecology	Bioethics Education Project, <i>The Integration of STS into Science Education</i> (Aikenhead, 1992), <i>Moral Sensitivity in the Context of Socioscientific Issues in High School Science Students</i> (Fowler, Zeidler, & Sadler, 2008)
10 (11/2)	SSI/STS	
11 (11/9)	Final Project Presentations	
12 (11/16)	eSmart Recycling Tour	We will meet at eSmart Recycling located at 5100 Vivian Pl, Tampa, FL 33619 at 5pm
X (11/23)	Thanksgiving Holiday - No Class	
13 (11/30)	Final project Due	

***NOTE: This schedule is a living document and is subject to revision.**

Please follow the schedule in Canvas and in Class.

Global Citizens Project

SCE 4863 is certified as a Global Citizens course and may be used to fulfill partial requirements of the Global Citizen Award upon successful completion of the course (final grade of B or higher).

USF Core Syllabus Policies

USF has a set of central policies related to student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, pregnancy and related conditions, and sexual harassment that **apply to all courses at USF**. Be sure to review these online:

<https://www.usf.edu/provost/faculty-success/resources-policies-forms/core-syllabus-policy-statements.aspx>

Student Recordings

Florida Statute 1004.097 Free Expression on Campus

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal, educational use (USF Policy 10-048). A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach enrolled students about a particular subject. Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, private conversations between students in the class or between a student and the faculty member is prohibited. Recordings may not be used as a substitute for class participation and class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the USF Student Conduct Code.

Course Policies: Grades

Your grade in this course will be determined by your level of completion and thoroughness of all assignments and your participation in class. These, along with your preparedness to discuss the readings and attendance, are an important component of your grade. Please read the syllabus in full; you are responsible for knowing what is required of you.

Please be sure to use APA 7 format for your assignments, Times New Roman, 12 point font, double spaced.

- All coursework must be completed on time to receive full credit. If for some reason you are unable to turn in an assignment by the due date, you must come speak to me regarding your extenuating circumstances for possible consideration of an extension.
- Complete the reading assignments BEFORE attending class. Our time together in class will further enhance your depth of understanding of the reading material through discussion and sharing of interpretations and concepts. Your preparation for each class is vital to your success.
- **Please be sure to check Canvas and your emails daily for announcements.**
- All written assignments should be prepared electronically and turned in on Canvas before class by the due dates posted.
- Grades and comments regarding your work will be posted on Canvas for your review.

Late Work Policy: As this course is intended to support the continuous development of professional learning, timely submission of assignments is a requirement in order to demonstrate conceptual understanding and generation of teacher knowledge over time. As such, all late assignments may be considered to receive up to 50% of the graded assignment based on communication prior to due date. Otherwise, late assignments will not be graded.

Attendance is essential; most of the learning will be occurring during class with discussions and activities. **Please note that this is an in-person class.** Students are expected to attend all scheduled class sessions. However, due to circumstances beyond your control (ex: illness) you may be absent during the semester at some point. **Unexcused absences will result in a deduction from the overall grade for each unexcused absence.** Excused absences will not result in a deduction of points with proper documentation provided within one week (7 days) of the missed class. Documentation must be dated *before or on* the date of missed class and signed. (i.e., doctor's notes dated the day after the missed class will not be accepted as documentation). In addition, *tardiness or early self-dismissals will be documented as absences.* Arriving late or leaving early *will be counted as an absence unless documentation is provided before or on the date.* As a courtesy to your instructor and your classmates, please let me know when you will be out of class so that accommodations in group structure, etc. can be made. Please do not schedule any appointments during class time, they will not be considered excused absences. If absent with an excused absence, it is your responsibility to ensure any assignments due are turned in, and to find out what tasks you need to complete. Please note that given the hands-on nature of our course, many in-class activities cannot be "made up."

To clarify, please do NOT schedule appointments of any kind during class time – they will not be considered excused absence. If absent, it is your responsibility to ensure any assignments due are turned in, and to find out what tasks you need to complete to make up for the missed time.

Punctuality:

Please arrive on time for class. Students who arrive to class late may suffer a reduction in their final class grade. Habitual late arrivals or early departures will be considered unexcused

absences, which will adversely affect your grade. It is recommended to arrive at least 5 to 10 minutes early.

Grades of "Incomplete"

The current university policy concerning incomplete grades will be followed in this course. For undergraduate courses: An "I" grade may be awarded to a student only when a small portion of the student's work is incomplete and only when the student is otherwise earning a passing grade. The time limit for removing the "I" is to be set by the instructor of the course. For undergraduate students, this time limit may not exceed two academic semesters, whether or not the student is in residence, and/or graduation, whichever comes first. For graduate students, this time limit may not exceed one academic semester. "I" grades not removed by the end of the time limit will be changed to "IF" or "IU," whichever is appropriate.

Campus Free Expression

It is fundamental to the University of South Florida's mission to support an environment where divergent ideas, theories, and philosophies can be openly exchanged and critically evaluated. Consistent with these principles, this course may involve discussion of ideas that you find uncomfortable, disagreeable, or even offensive.

In the instructional setting, ideas are intended to be presented in an objective manner and not as an endorsement of what you should personally believe. "Objective" means that the idea(s) presented can be tested by critical peer review and rigorous debate, and that the idea(s) is supported by credible research.

In this course you may be asked to engage with complex ideas and to demonstrate an understanding of the ideas. Understanding and engaging with an idea does not require you to believe it or to agree with it.

Course Policies: Technology and Media

Canvas:

This course will be offered via USF's learning management system (LMS), Canvas. If you need help learning how to perform various tasks related to this course or other courses being offered in Canvas, please view the following videos or consult the Canvas help guides. You may also contact USF's IT department at (813) 974-1222 or help@usf.edu.

Laptop Usage:

Laptop and cell phone usage: Non course related laptop and cell phone use during class time is not permitted unless we are engaged in a project that requires the use of a laptop or cell phone.

Phone Usage:

Non course related cell phone use during class time is **not permitted** unless we are engaged in a project that requires the use of a cell phone.

Classroom Response Clickers: If your course includes the use of student response devices, provide specifics about the usage and how to get started.

Course Policies: Student Expectations

Health and Wellness

Your health is a priority at the University of South Florida. We encourage members of our community to look out for each other and to reach out for help if someone is in need. If you or someone you know is in distress, please make a referral at www.usf.edu/sos so that the Student Outreach & Support can contact and provide helpful resources to the student in distress. A 24-hour licensed mental healthcare professional, offered through the counseling center, is available by phone at 813-974-2831, option 3. Please remember that asking for help is a sign of strength. In case of emergency, please dial 9-1-1.

Title IX Policy

USF is committed to fostering a safe and respectful learning environment, free from sex discrimination and sexual harassment, in accordance with Title IX and USF Policy 0-004. If a student shares an experience of sexual harassment, sexual assault, stalking, or relationship violence with a USF employee (including faculty), that employee will notify the Title IX Office. This allows the Title IX Office to send the student an email with information about support resources and options—if it is safe to do so. Students are not required to respond to this email. The Title IX Office is a private resource. Information is shared only on a need-to-know basis to provide students with support measures. To speak to a confidential resource, students may contact USF Center for Victim Advocacy at 813-974-5757. Confidential resources do not notify the Title IX Office unless the

student requests it. For more information about Title IX, available resources, or to make a report, please visit www.usf.edu/title-ix.

Course Hero / Chegg Policy

The USF Policy on Academic Integrity specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

Professionalism Policy

Per university policy and classroom etiquette; mobile phones, iPods, etc. must be silenced during all classroom and lab lectures. Those not heeding this rule will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time for all class meetings. Students who habitually disturb the class by talking, arriving late, etc., and have been warned may suffer a reduction in their final class grade.

Turnitin.com

In this course, turnitin.com may be utilized. Turnitin is an automated system which instructors may use to quickly and easily compare each student's assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you may be expected to submit all assignments in both hard copy and electronic format. After the assignment is processed, as instructor I receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process visit <http://www.turnitin.com>.

Netiquette Guidelines

- Act professionally in the way you communicate. Treat your instructors and peers with respect, the same way you would do in a face-to-face environment. Respect other people's ideas and be constructive when explaining your views about points you may not agree with.

- Be sensitive. Be respectful and sensitive when sharing your ideas and opinions. There will be people in your class with different linguistic backgrounds, political and religious beliefs or other general differences.
- Proofread and check spelling. Doing this before sending an email or posting a thread on a discussion board will allow you to make sure your message is clear and thoughtful. Avoid the use of all capital letters, it can be perceived as if you are shouting, and it is more difficult to read.
- Keep your communications focused and stay on topic. Complete your ideas before changing the subject. By keeping the message on focus you allow the readers to easily get your idea or answers they are looking for.
- Be clear with your message. Avoid using humor or sarcasm. Since people can't see your expressions or hear your tone of voice, meaning can be misinterpreted.

Email and Discussion Board Guidelines

- Use the subject line effectively by using a meaningful line of what your email or discussion is about.
- Keep your emails and postings related to the course content. You should not post anything personal on a discussion board unless it is requested by the instructor.
- Any personal, course or confidential issues should be directly communicated to the instructor via email. The discussion boards are public spaces; therefore, any issues should not be posted there.

End of Semester Student Evaluations

All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.

Food and Drink Policy (for in-campus sessions only).

Please adhere to the firm policy of no beverages (other than bottled/capped water), food, tobacco products, or like items in the classroom. Your understanding of the necessity for this policy and cooperation will be greatly appreciated. This policy will be strictly enforced.

Learning Support and Campus Offices

Academic Accommodations

Students with disabilities are responsible for registering with Student Accessibility Services (SAS) in order to receive academic accommodations. For additional information about academic accommodations and resources, you can visit the SAS website.

[SAS website for the Tampa campus and Sarasota-Manatee Teachout site.](#)

[SAS website for the St. Pete campus.](#)

Academic Support Services

The USF Office of Student Success coordinates and promotes university-wide efforts to enhance undergraduate and graduate student success. For a comprehensive list of academic support services available to all USF students, please visit the [Office of Student Success website.](#)

Canvas Technical Support

If you have technical difficulties in Canvas, you can find access to the Canvas guides and video resources in the “Canvas Help” page on the homepage of your Canvas course. You can also contact the help desk by calling 813-974-1222 in Tampa or emailing help@usf.edu.

[USF IT Services](#)

Center for Victim Advocacy

The [Center for Victim Advocacy](#) empowers survivors of crime, violence, or abuse by promoting the restoration of decision making, by advocating for their rights, and by offering support and resources. Contact information is available online.

Counseling Center

The Counseling Center promotes the wellbeing of the campus community by providing culturally sensitive counseling, consultation, prevention, and training

that enhances student academic and personal success. Contact information is available online.

[Counseling Center website for the Tampa campus and Sarasota-Manatee Teachout site.](#)

[Counseling Center website for the St. Pete campus.](#)

Tutoring

The Tutoring Hub offers free tutoring in several subjects to USF undergraduates. Appointments are recommended, but not required. For more information, email asctampa@usf.edu.

[Tutoring website for the Tampa campus and Sarasota-Manatee Teachout site.](#)

[Tutoring website for the St. Pete campus.](#)

Writing Studio

The Writing Studio is a free resource for USF undergraduate and graduate students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, email: writingstudio@usf.edu.

[Writing studio website for the Tampa campus and Sarasota-Manatee Teachout Site.](#)

[Writing studio website for the St. Pete campus.](#)

Student Ombuds Office

Florida Statute 1006.51 and Florida Board of Governors Regulation 6.011 require that all public institutions provide ombuds services to students. The Student Ombuds Office at USF is a confidential, impartial, informal, and independent resource for students experiencing challenges related to the university. Ombuds can help students safely explore options, clarify processes, and consider next steps. [Learn more or make an appointment at usf.edu/student-ombuds.](https://usf.edu/student-ombuds)