



Science, Technology, and Society (EDCP 452 301)

EDCP 452.301

University of British Columbia

Department of Curriculum and Pedagogy

2021

Course Description:

This course focuses on Science, Technology, and Society (STS) and related practices. STS is both a framework for knowledge and a course or program of studies. This course explores the necessity of STS for children and youth and challenges teacher candidates to create curriculum that addresses contemporary STS problems. STS is interdisciplinary and addresses knowledge and problems that span science education, technology education, and social studies. In addition to curriculum for STS, the course facilitates the development of inquiry-based reasoning and depth of knowledge in select STS issues and topics (e.g., Covid-19, critique of technology, environment).

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Valued Ends of the Course:

My intention is to help you develop a background and a depth of expertise for understanding and practicing STS.

COURSE OBJECTIVES

Upon completion of this course, the student should have developed:

1. A deep understanding of STS and core concepts and problems.
2. A discernment of effective STS activities and challenges, including the preparation of unit curriculum for fostering critical, creative, and innovative thinking.

Required Text:

1. *Science, Technology, and Society Readings*. (Download all from <https://canvas.ubc.ca>)

Assessment (see details below):

1. Participation (20%)
2. STS Unit Packet (40%)
3. Explainer Video (40%)

Deadline:

Ongoing
 Oct 19
 Dec 8

- **Academic Honesty and Standards, and Academic Freedom:** Please refer to *UBC Calendar*
- **Policies and Regulations (Selected):** <http://www.students.ubc.ca/calendar>
- **Academic Accommodation for Students with Disabilities:** Students with a disability who wish to have an academic accommodation should contact the Disability Resource Centre without delay (see UBC Policy #73 www.universitycounsel.ubc.ca/policies/policy73.pdf).

Operational Definition of Letter Grade Categories (EDCP, Revised, June 1996)

Letter Grade	Percent Range	Sample Description
A+	90-100	Work of outstanding quality. Demonstrates excellent comprehension of the subject and use of existing literature and research. Consistently applies a high level of critical scrutiny to texts and discussions. Frequently articulates innovative ideas based on a broad background. Shows a high degree of personal engagement with the topic. Consistently integrates broad orientations towards curriculum with particular lesson objectives and instruction and assessment strategies.
A	85-89	Demonstrates good comprehension of the subject. Is able on occasion to articulate original critical insights. Good use of existing knowledge in the subject. Shows personal involvement in the work. Understands the relationships among broad curriculum orientations, lesson objectives and instruction and assessment strategies.
A-	80-84	
B+	76-79	
B	72-75	Demonstrates good comprehension of the subject. Is able on occasion to articulate original critical insights. Good use of existing knowledge in the subject. Shows personal involvement in the work. Understands the relationships among broad curriculum orientations, lesson objectives and instruction and assessment strategies.
B-	68-71	
C+	64-67	
C	60-63	Adequate work. Fair comprehension of the subject. Shows few original critical insights. Background knowledge may have significant deficits. Minimal personal involvement in the work. Inconsistently integrates broad curriculum orientations, lesson objectives and instruction and assessment strategies.
C-	55-59	
D	50-54	
F	0-49	Minimally adequate work, barely at a passing level. Serious flaws or deficits in understanding. Unable to integrate broad curriculum orientations, lesson objectives and instruction and assessment strategies.
		Failing work. Inadequate for successful completion of the course or submitted beyond final date of acceptance.

Course Schedule

Date	Module	Activity	Assignment	Module Topics (see Readings next section)
Week 1 Sept. 7-12	Intro	Introductions & Networking	Orientation + Course Intro	Course introduction + SOUL
Week 2 Sept. 13-19	Intro - #1	Grouping & Planning	Readings & Assignments	Module 1: STS and Curriculum Design in K-12 Education
Week 3 Sept. 20-26	# 1	Case Studies & Modules	Readings & Assignments	Module 1: STS and Curriculum Design in K-12 Education
Week 4 27-2 Oct.	#2	Unit Plans & Explainer Videos	Readings & Assignments	Module 2: Criticism and Critique of Science and Technology in STS
Week 5 Oct. 3-9	#2	Case Studies & Modules	Readings & Assignments	Module 2: Criticism and Critique of Science and Technology in STS

Week 6 Oct. 10-16	#3	Unit Plans & Explainer Videos	Readings & Assignments	Module 3: Conceptualizing, Communicating, and Explaining STS Issues
Week 7 Oct. 17-23	#3	Sharing Unit Plans	Unit Plan Due	Module 3: Conceptualizing, Communicating, and Explaining STS Issues
Oct. 25- Nov. 5	School-based Orientation Practicum			
Week 10 Nov. 7-13	#3	Case Studies & Modules	Readings & Assignments	Module 3: Conceptualizing, Communicating, and Explaining STS Issues
Week 11 Nov. 14-20	#4	Explainer Videos	Readings & Assignments	Module 4: Current Issues in STS (i.e., Covid)
Week 12 Nov. 21-27	#4	Case Studies & Modules	Readings & Assignments	Module 4: Current Issues in STS (i.e., Covid)
Week 13 28-4 Dec	#5	Explainer Videos	Readings & Assignments	Module 5: Ethics and STS
Week 14 Dec. 5-11	#5	Sharing Explainer Videos	Explainer Video Due	Module 5: Ethics and STS
Week 15 Dec. 12-18.	#5	Bringing Closure		Module 5: Ethics and STS

Course Major Topics & Readings

1. Module 1: STS and Curriculum Design in K-12 Education

Butler, G., Heslop, S., & Kurth, L. (2015). A ten-step process for developing teaching units. *English Teaching Forum*, 53(3), 1-12.

Voulvoulis, N., & Burgman, M. A. (2019). The contrasting roles of science and technology in environmental challenges. *Critical Reviews in Environmental Science and Technology*, 49(12), 1079-1106.

References

BC MoE. (1995a). [Science-Technology-Society](#). In *Science & Technology 11: Integrated resource package 1995*. Victoria, BC: MoE.

BC MoE. (1995b). [Science & Technology 11: Integrated resource package 1995](#). Victoria, BC: MoE.

BC MoE. (2008). [Science and Technology 11: Integrated resource package 2008](#). Victoria, BC: MoE.

Zoller, U. (2013). Science, technology, environment, society (STES) literacy for sustainability: What should it take in chem/science education? *Educación Química*, 24(2), 207-214.

2. Module 2: Criticism and Critique of Science and Technology in STS

Petrina, S. (2017). Critique of technology. In P. J. Williams & K. Stables (Eds.), *Critique in design and technology education* (pp. 31-49). Dordrecht, NL: Springer.

Petrina, S. (2018). From crit to social critique. In M. J. de Vries (Ed.), *International handbook of technology education* (pp. 39-50). Dordrecht, NL: Springer.

3. Module 3: Conceptualizing, Communicating, and Explaining STS Issues

Rosenthal, S. (2020). Media literacy, scientific literacy, and science videos on the internet. *Frontiers in Communication*, 5, 1-7.

We Are Cognitive. (2021). Are animated explainer videos effective?
<https://www.wearecognitive.com/blog/animated-explainer-videos-effective>

References

Fiorella, L., & Mayer, R. E. (2018). What works and doesn't work with instructional video. *Computers in Human Behavior*, 89, 465-470.
 Hove, P. T., & van der Meij, H. (2015). Like it or not. What characterizes YouTube's more popular instructional videos? *Technical Communication*, 62(1), 48-62.

4. Module 4: Current Issues in STS (i.e., Covid)

Prasad, A. (2021). Anti-science misinformation and conspiracies: COVID-19, post-truth, and science & technology studies (STS). *Science, Technology & Society*, 1–25

References

Rogers, R. & Niederer, S. (2020). The politics of social media manipulation. In *The politics of social media manipulation*. Amsterdam, NL: Amsterdam University Press.

5. Module 5: Ethics and STS

Moore, S. L., & Ellsworth, J. B. (2014). Ethics of educational technology. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 113-127). Dordrecht, NL: Springer.

References

Herkert, J. R. (2008). Engineering ethics and STS subcultures. In H. Hartman (Ed.), *Integrating the sciences and society: Challenges, practices, and potentials* (pp. 51-69). Bingley, UK: Emerald.

Assignments

1. Participation

Participation is valued at 20% of your final grade. We refer to scholarly levels of participation as **academic conversation**, which entails a variety of things including articulation and presentation. Participation is interdependent with **preparation** for each class, which involves **reading, writing, organizing, reflecting, speaking**, and, of course, **media production**. While a variety of apps and media are readily available for organizing notes, consider Evernote for starters. Read deeply at least one of the required Readings for each Module. Read through the Module Introductions, consider the questions and offer other questions in Discussion or your notes, and process through the subsections or Case Studies within each Module. The standard is one *quality* Discussion post per module within the window of dates indicated, either in conversation with the authors / readings or with a peer's or several peers' comments. This facilitates and moderates progress in the course as a whole. **(20%)**

Participation

	Low-----	Avg-----	High
Appropriately and accurately articulates key constructs and themes in readings, videos, etc. in each module	1-----	3-----	6
Advances collective knowledge by engaging with authors, peers, and instructors	1-----	3-----	6
Brings new ideas and apps to the discussions	1-----	4-----	8
Total:	xx / 20		

2. STS Unit Packet

Prepare a STS unit packet for a specific grade range (e.g., 6-8, 8-10, 11-12) for a two week duration. The intention of a unit is to allow for depth while at the same time breadth in different areas of science, technology, and society. The key to a unit is planning. The most effective units entail a great amount of planning. Remember, the scale of curriculum increases as one moves from lesson plans and demonstrations to activities and projects and ultimately to units and courses. Units can be anywhere from 3 days to 3 weeks. They should involve a variety of activities, where some activities extend over more than one day. A unit plan is actually a collection of resources for the teacher and students. The unit packet format (10 pages) provided below is comprehensive and recommended for planning:

1. Introduction to the Unit	
a. Unit Theme	The theme of your unit
b. Rationale for the Unit	Explain the value of the unit
c. Resources used in the unit	List all resources needed for the unit
d. Standards	Please refer to the <i>Standards for Technological Literacy</i> , <i>Standards for Technological and Engineering Literacy</i> , and BC performance standards
e. Motivational Activities	What introductory activities will be used to interest and motivate students?
f. Equity and Aboriginal culture and perspectives	How does this unit support equity, including gender and racial equity and Indigenous ways of knowing?
2. Big Ideas	These represent the major concepts that will be taught. It is expected that from each Big Idea, several specific objectives could be pulled out. The BIs will cover the entire unit whether it is 3 design challenges or 10.
3. Competencies and Descriptions	Please refer to the BC curriculum core competencies for each of the activities. These come from the Big Ideas and represent the competencies that would be included on all of the lesson plans for the unit. They are more specific than the Big Ideas. Competencies should be assessable (Short-term or immediate objectives).
4. Introductory Activity	The main methods for teaching each BI while not as detailed as the instructional procedures in a lesson plan, they should contain key information. Example: Discussion questions should be included, design challenges should be spotlighted, example resolutions should be presented, role play scenarios should be explained, etc.
5. Developmental Activities	Activities necessary to resolving the design & project briefs, including special safety activities.
6. Three to Five Design or Project Briefs	Placeholder: if you have these design or project briefs, include. *Not required for this assignment.
7. Adaptations for Diversity	How will you adapt your classroom facility and content for students with diverse learning needs?
8. Daily Calendar	Scheduling activities and design challenges
9. Unit Evaluation/Culminating Activity	Assessment & evaluation activities and procedures
10. Bibliography / Resources	List all sources consulted in preparation of the unit
11. Appendix	
a. Special Considerations	If any
b. Letter to the Parents	If necessary

3. Explainer Video (40%) (Groups of 2)

Plan, script, and produce and Explainer Video that addresses an issue in STS. Develop an idea, storyboard, script, animate or film, and edit for airing on YouTube or Vimeo. “Explainer videos are short animated or live action videos that communicate a message in a clear, concise, and memorable way” ([Creamy Animation, 2021](#)). Design the explainer for an adolescent or teen audience (e.g., 4-6, 7-8, 9-10, 11-12) and explain the ethical dilemma or issue with age-appropriate depth and engagement. Draw on theoretical insights and inquiry-based reasoning. The video should be engaging (e.g., dramatic, humorous, serious, punchy, cheeky, etc.) and designed to inspire dialogue and inquiry, and pedagogical to address challenges for students and teachers

Format: 00:01:30 seconds (1.5 min +/- 10 secs) exported to YouTube or Vimeo. Unless entirely original, the explainer must include attribution. Option 1: scroll or make the final frame the acknowledgements or credits for key sources of substantive images or clips. Option 2: keep a companion reference/source list that is accessible as a download (e.g., link in a description on YouTube).