Social dimensions of science and technology education (2 credits)

Instructor: Aswathy Raveendran

Course Code: SCE202.2
Course Type: Foundational Elective
Credits: 2

Course Day and Time: Wednesday (2 PM to 4 PM)
Starting from January 19, 2022

This course will situate STEM education in context; the context being the larger sociopolitical mileu within which STEM knowledges are produced and STEM education is practiced. The objectives of the course are the following:

1. To draw on literature within the fields of history, philosophy and sociology of science to unravel the nature of science and technology and its relationship with Indian society

2. To discuss the structural constraints that learners of science and technology grapple with when engaging with STEM education drawing on historical, sociological and identity related research that has explored these issues

3. To discuss the larger sociopolitical contexts within which science and technology education and STEM research in India and abroad is located and how these contexts influence the agenda of STEM education

The course will enable learners to:

1. Understand how the sociopolitical context shapes the nature of scientific and technological knowledge

2. Understand that learners of science and technology are not homogenous: the development of able STEM identities is shaped by structural inequalities that are an outcome of caste, class, ableism and patriarchy.

3. Critically evaluate the purposes and goals of STEM education/research

Duration:

Meet once every week for 2 hours for 14 weeks. Participants are expected to read in advance and discuss the readings in the course. Guest lectures/sessions will be arranged for specific topics.

Assessment (will be finalised after discussion with course participants):

1. Reflective/autobiographical writing/ term papers/ a minor research study
2. The nature of participants' participation in the course throughout (formal/informal discussions, sharing resources/reflections in the email list)

Timeline (tentative)

Break up	Topic
Classes 1-2	Understanding the nature of science: sociopolitical
Classes 3-4	perspectives
Classes 5-6	
Classes 7-8	Locating the learners of STEM in the sociopolitical
Classes 9-10	context
Classes 11-12	Locating STEM Education and research in the
Classes 13-14	

Selected readings for the course*

1. Sarukkai, S. (2012). What is science? National Book Trust India: New Delhi (selected chapters)

2. Subramaniam, B. (2000). Snow Brown and the Seven Detergents: A metanarrative on science and the scientific method. *Women's Studies Quarterly*, *28*(1/2), 296-304.
3. Bala, A. (2006). *The dialogue of civilizations in the birth of modern science*. Springer. (selected chapters)
4. Mulkay, M. (1979). Science and the Sociology of knowledge. London: George Allen & Unwin Ltd
5. Stengers, I. (2003). The doctor and the charlatan [Translated by Muecke, Stephen.]. *Cultural Studies Review*, *9*(2), 11-36.
6.Chadha, G. (2005). Towards an informed science criticism: The debate on science in postcolonial India. In K. Ganesh, & U. Thakkar (Eds), Culture and the making of identity in contemporary India (pp. 247–258). New Delhi: SAGE Publications.
Nandy, A. (1989). Science as a Reason of State. Science as Culture, 1(7), 69-83
7. Longino, H. E. (1987). Can there be a feminist science?. *Hypatia*, *2*(3), 51-64.
8. Sur, A. (2001). Dispersed radiance: Women scientists in CV Raman's laboratory. Meridians: feminism, race, transnationalism, 1(2), 95-127.
9. Gee, J. P. (2000). Chapter 3: Identity as an analytic lens for research in education. *Review of research in education*, *25*(1), 99-125.
10. Tolbert, S., & Bazzul, J. (2017). Toward the sociopolitical in science education. *Cultural Studies of Science Education*, *12*(2), 321-330.
11. Carter, L. (2005). Globalisation and science education: Rethinking science education reforms. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, *42*(5), 561-580.

Documentaries/Movies/Videos (could be screened outside of the course hours for interested participants)

1. Nostalgia for the Light by Patricio Guzman
2. War and Peace (2003) by Anand Patwardhan
3. Secrets of the surface : Mathematical vision of Maryam Mirzakhani

(other documentaries on similar themes may be screened based on participants suggestions)

* The finalised set of readings will be updated a week ahead of the inception of the course. Readings may change based on the perceived needs and interests of the course participants