

## **Perspectives on Science, Technology and Society**

Course type: 4 credit course

Course Instructor: Dr. Aswathy Raveendran

Duration: August 6, 2018- October 12, 2018

The aim of the course is to help build perspective on the various positions on the nature of science, its relationship with technology and society. The course is premised on the notion that it is important for all science education researchers to be acquainted with these perspectives so that they can confidently address ethicopolitical concerns related to science and technology as and when they encounter them in their work. Unit I introduces participants to perspectives on the nature of science, technology and society. The reading by Philip Kitcher (2003), titled “unacceptable images” for instance, begins with the question of what the role of science is in a democratic society. He argues that the authority that science has acquired for itself has a basis in its claim of representing accurate knowledge of the world. The next set of readings are aimed at engaging with this point put forth by Kitcher: can science indeed claim the status of objective, value-free knowledge? To unravel this, a few introductory readings on the classical ideas the philosophy of science and the criticisms of these standard views from the feminist and sociological perspectives will be discussed.

Following this, a reading on the nature of technology will be introduced which seeks to outline two broad philosophical approaches within the field -- the classical view that upholds technological determinism and the social construction of technology view that emphasises the nature of technology as shaped by the social context wherein it is conducted. Following this, two readings in the area of Public Understanding of Science which outlines the debates within the field will be discussed. These readings seek to demonstrate that the relationship between science and its publics is not a harmonious one, and is often imbued with power.

Unit II seeks to introduce course participants to the debates regarding science and society in the Indian context. These readings will help illustrate how different groups have interpreted science as an ideology in the Indian context and outline four positions on the issue- the liberal, leftist, postcolonial and hindutva positions. Unit III attempts to introduce the democratic and sociopolitical turns within science education which has taken cognizance of the perspectives on the relationship between science and society and tried to argue for the introduction of these perspectives into science education research and praxis.

### **Assessment**

Course participants are expected to engage with all the readings. They will take turns to lead the discussion on the prescribed readings. Short summaries of the readings could be circulated before the class. There shall be two short assignments and one term paper. The grading will be done on the basis of presentations done throughout the course, classroom participation and performance on assignments and the term paper.

## List of Readings

### Unit 1

#### The Nature of Science and Technology and its relationship with society

- Kitcher, P. (2003). Science, truth, and democracy. Oxford University Press. (chapter 1, Unacceptable images)
- Samir Okasha (2003). Philosophy of science: a short introduction. (chapter 1- What is science?)
- Sismondo, S. (2010). An introduction to science and technology studies (Vol. 1). Chichester: Wiley-Blackwell. (Chapter 1, The Prehistory of Science and Technology Studies chapter 15, The Public Understanding of Science and Chapter 9- Two questions regarding technology)
- Mulkay, M. (1979). Science and the Sociology of knowledge. London: George Allen & Unwin Ltd.
- Keller, EF. (2001). Gender and Science: An update. In M. Wyer (Ed.) Women, science and technology, A reader in feminist science studies (132-142). New York: Routledge.
- Wynne, B. (1992). Misunderstood misunderstanding: social identities and public uptake of science. *Public Understanding of Science*, 1, 281-304.

### Unit 2

#### Situating science and society in India

- Raina, D. (2006). Towards a global history of science, its history and theory of history. In M. Dutta and S. Nevatia (Eds.) Sites and practices, an exercise in cultural pedagogy (232-242). Mumbai: Majlis
- 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.
- Nanda, M. (1997). Against social de (con) struction of science: Cautionary tales from the third world. *Monthly Review*, 48(10), 1.
- Nanda, M. (September, 2016). Hindutva's science envy. *Frontline*. Retrieved from <https://www.frontline.in/science-and-technology/hindutvas-science-envy/article9049883.ece>
- Varughese (2014). 'The Public Life of Expertise', Seminar 654 (State of Science: A Symposium on the Relationship between Science, Knowledge and Democracy), pp. 21-26.

### Unit 3

#### STS perspectives and Science Education

- Driver, R., Leach, J., & Millar, R. (1996). *Young people's images of science*. UK: McGraw-Hill Education. (chapter 2)
- Hodson, D. (2003). Time for action: Science education for an alternative future. *International Journal of Science Education*, 25(6), 645-670.
- Brotman, J. S., & Moore, F. M. (2008). Girls and science: A review of four themes in the science education literature. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, 45(9), 971-1002.
- Allchin, D. (2001). Values in science: An educational perspective. In *Science education and culture* (pp. 185-196). Springer Netherlands.
- Rudolph, J. L. (2005). Inquiry, instrumentalism, and the public understanding of science. *Science*

*Education*, 89(5), 803-821.

Levinson, R. (2010). Science education and democratic participation: An uneasy congruence?. *Studies in Science Education*, 46(1), 69-119.

Pedretti, E., & Nazir, J. (2011). Currents in STSE education: Mapping a complex field, 40 years on. *Science education*, 95(4), 601-626.

**Documentaries:**

Nostalgia for the Light by Patricio Guzman

War and Peace (2003) by Anand Patwardhan

Alternative medicine debate in India (Debating Matters, British council India)