

HUMANITIES COURSES

1. Civilization of India and Science

Classical Indian ideas of reliable knowledge and how they were affected by Indic thinking about science will be outlined. Using examples from mathematical astronomy and Ayurveda the nature of Indic rationality will be discussed. The question asked by Needham, about the failure of India and China to develop modern science during the last 400 years while being ahead during the European dark ages, will also be analysed.

Materials and civilization are said to be synonymous. The contributions of India to the development of materials will be presented. These include the legendary wootz steel and their use in Damascus swords, high tin bronzes and zinc. The development of sophisticated processing in casting (lost wax process) and wrought products will be described. A comparison of the materials heritage of China and India will be offered. The contributions of Cyril Stanley Smith in archeological sciences will be highlighted.

Needham. J, with the research assistance [and collaboration] of Wang Ling

Science and Civilization in China, by (1954–59) (2 volumes).

Smith, Cyril Stanley. (1890, 1988).,History of Metallography: The Development of Ideas

on the Structure of Metals Before [ISBN 0-262-69120-5](#), MIT Press.

Smith, Cyril Stanley (1982). From Art to Science, [ISBN 0-262-19181-4](#), MIT Press.

Bose D M, Sen S N & Subbarayappa B V (Second edition) A Concise History of Science in India, Ind. Natl. Sc. Academy.

Chattopadhyaya D P, Debiprasad 1991 History of Science and Technology in Ancient India. Firma KLM, Calcutta.

Narasimha R 2003 Interdisciplinary Science Reviews, 48:1-13.

2. Economics for the S&T professional

The course will aim to simultaneously provide the students an introduction to basic economic concepts as well as to the post-independence evolution of the Indian economy. It will do so through lectures that focus on a specific development in the evolution of the Indian economy and explain the theoretical concepts that are needed to understand that development. The specific developments will be chosen in a way that reflects both their significance to the economy as well as to allow for a smooth movement from the relatively simple concepts to the more complex ones. An effort will also be made to emphasize developments that are likely to be of interest to a young scientist stepping out into the Indian or global economy. In the process the course will cover most of the concepts that are there in a standard introductory economics textbook, say the one by Samuelson and Nordhaus, while also covering concepts that came to be used in the Indian economy such as *Badla*. It would also cover elements of economic management that

have greater policy significance in India than in several other countries, such as the budget of the Central government

Samuelson, Paul A and William Nordhaus (2009) *Economics* 19th edition, McGraw-Hill/Irwin

Frankel, Francine R (2005) *India's Political Economy 1947-2004: The Gradual Revolution* Oxford University Press

Dreze, Jean and Amartya Sen (1999) *India: Economic Development and Social Opportunity* Oxford University Press

3. Science, Technology and Policy

The course objectives are twofold: one, to introduce students to the Indian social, economic and political environment and the Indian development imperatives, and two, to introduce students to the concept of policy, especially science and technology policies, and initiate discussion on matters pertaining to these, to explore the appropriate answers to national development, sectoral growth and role of Science and Technology (S&T) research. The course provides students with the foundations for learning to recognize the role of S&T in finding viable solutions to today's pressing problems, and understanding how to implement them in the contemporary policymaking environment.

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Crow, M. (2000). Linking scientific research to societal outcomes. 25th AAAS Colloquium of Science and Technology Policy, held April, 11-13, Washington D.C.

Jasanoff, S., Markle, G. E., Petersen, J. C., and Pinch, T. J. (Eds.) (1995). Handbook of Science and Technology Studies. Sage Publications.

Sismomdo, S. (2008). An Introduction to Science and Technology Studies. Edition 6. Wiley-Blackwell Publishing.

Williams, R. and Edge, D. (1996). The social shaping of technology. Research Policy, Vol. 25, pp. 856-899.

4. Culture and Science

“Society” and “culture” are outsiders to knowledge-making in the natural sciences that concentrates on “nature” as its object of study. However, debates in climate change, ecology now recognize the need to integrate between science and “society”, and initiate dialogue between science and “culture”. The term *culture*, serves as a vantage point from which to respond to science, giving rise to a slew of questions – is science Indian? Is an Indian science possible? What might be the relationships between Indian scientists and their cultures?

This course hopes to explore in some detail this trajectory – of culture as a place from which to respond to science. It will therefore hope to encourage an examination of knowledge-making itself as it inheres in disciplines. The nature of knowledge itself will change depending on the perspectives from which it

begins; it cannot be universal and common to all. If this be true, how do we do science differently in cultures? Does this different field continue to be called science?

Barnes, S. B. 1974. *Scientific Knowledge and Sociological Theory*. London: Routledge and Kegan Paul.

Bhattacharya, S. 2005. *The Mahatma and the Poet: Letters and Debates between Gandhi and Tagore, 1915-1941*. New Delhi: National Book Trust. (1997).

Chakrabarti, P. 2004. *Western Science in Modern India: Metropolitan Methods, Colonial Practices*. New Delhi: Permanent Black.

Habib, S. I. and D. Raina. Eds. 1999. *Situating the History of Science: Dialogues with Joseph Needham*. New Delhi: Oxford University Press.

Harding, S. 1991. *Whose Science? Whose Knowledge? Thinking from Women's Lives*. Ithaca: Cornell University Press.

Nandy, A. 1988. *Science, Hegemony, and Violence: A Requiem for Modernity*. New Delhi: Oxford University Press.