

Centre for Studies in Science Policy

School of Social Sciences

Course Title: Analysis in Science & Technology Policy

Course No. & Type: SP601 (PhD), Compulsory

Faculty in Charge: Saradindu Bhaduri (Course Coordinator),

Madhav Govind, Rajbeer Singh, Reeta Sony A.L., Anamika Gulati

Mode of Evaluation: 1. A term paper on a selected problem (40%)

2. Seminar presentation (30%)

3. Book Reviews (30%).

Credits: 4

Instruction Method: Lecture-cum-Seminar

1. Nature of the Course

This course has been designed to cater to the needs of PhD students in the area of science policy studies. It exposes students to various socioeconomic and political dimensions of S&T policies. It has been conceived under certain assumptions: Science and technology have, in modern times become a force of almost all pervasive character. This realization is being reflected in the accelerated growth of funding, human resource and activities of scientific enterprise since the 1950s. The issues involving S&T Policies have been appearing with increasing frequency on the national as well as international agenda along with emergence of science policy and planning organization. The increasing complexity of science-society-nature interrelationship is not only going to have implications for scientists, administrators and planners of science and science policy analysts but also common people. The main focus of this course is intended to be on India and the developing countries.

II. Course Outline

1. Policy Studies: Basic concepts and key theoretical frameworks will be discussed.

Rational-Comprehensive, Incrementalism, Group Theory, Elite Theory, Functional Theory, Public Choice, Political System Theory, Institutionalism, Corporatism, Neo-Institutionalism, Evolutionary analysis of policy.

• Essential Readings:

1. Parsons, Wayne (1995) Public Policy: An Introduction to the Theory and Practice of Policy Analysis. (Part One). Edward Elgar.
2. Birkland, Thomas A. (2019). An Introduction to the Policy Process: Theories, Concepts, and Models of Public Policymaking. Routledge.

2. The Multiple Origins of Science Policy Studies

This module will discuss the various contributory elements of science policy studies. It will discuss how Economics of technological change. Social studies in Science, History of Science Studies, and Philosophy of Science merged to forms the discipline of science policy studies.

- **Essential Readings:**

1. Martin, B. R. (2012). The Evolution of Science Policy and Innovation Studies. *Research Policy*, 41(7), 1219-1239.

(Additional references will be given by S Bhaduri and M Govind)

3. Tools of Science Policy:

Scientific infrastructure. Indicators of R&D and Innovations; Patents and IPR; Incentives policy for R&D and Innovations; R&D collaborations; R&D Funding; Concepts & Historical Perspective on Technology Assessment and Forecasting (TATF). Technology foresight.

- **Essential Readings:**

1. OECD & Statistical Office of the European Communities (2018). *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation*. OECD publishing.
2. *Bogota Manual on Standardisation of Indicators of Technological Innovation*.
3. Das, A.K.; Arora, P. & Bhattacharya, S. (2012). Webliography of STI Indicator Databases and Related Publications. *Journal of Scientometric Research*, 1(1), 86-93.

(Additional references will be given by Rajbeer Singh in class)

4. Science Policy in India:

a. Historical account of India's Science Policy Initiatives:

Scientific Policy Resolution 1958, Science and Technology Plan 1973; Technology Policy Statement 1983; Science and Technology Policy 2003; Science Technology and Innovation Policy 2013. IPR Policy 2016. Interaction between S&T and Economic Policies, Sectoral Policies.

- **Essential Readings:**

1. Original Science Policy Documents from DST, Government of India website (<https://dst.gov.in/documents/policy-documents>).
2. DST Research and Development Statistics (Various years) (<http://www.nstmis-dst.org/Pdfs/R&DStatisticsataGlance2019-20.pdf>).
3. Badhuri, S., & Noklenyangla (2015). Seventy-Five Years of National Planning Committee (1938–2013): A Recollection. *Science and Culture*, 81(3-4), 66-70.
4. Badhuri, S., Yadav, S.M. & Noklenyangla. Science Policy in India: the canvas and the trajectory. (Forthcoming in Handbook on Indian Economy; Routledge) (private copies will be circulated until published).
5. Krishna, V. V. (2022). India@75: Science, Technology and Innovation Policies for Development. *Science, Technology and Society*, 27(1), 113-146.

(Additional references will be given by S Bhaduri in class)

b. India's evolving Science Policy Infrastructure:

- Political Dimensions of Science Policy Structure in India Evaluation of Apex Science Policy Body, S&T in Parliament, State S&T Councils; CSIRs.
- Human resources for S&T in India.

- **Essential Readings:**

(References will be given by Rajbeer Singh in class)

5. India's International Treaties in S&T Policy

- Bilateral and Multilateral Treaties
 - (International Patent Regime, WTO, Labour Standards, Convention on Biodiversity, etc.)

- **Essential Readings:**

1. Axelrod, Robert (1984). *Evolution of Cooperation*. Basic Books, New York.
2. Hale, Thomas, David Held, and Kevin Young (2013). *Gridlock: Why Global Cooperation is Failing When We Need It Most*. Polity.
3. Herbert, A. L. (1996). Cooperation in International Relations: A Comparison of Keohane, Haas and Franck. *Berkeley Journal of International Law*, 14, 222.
4. International Cooperation in Science, Technology and Innovation: Strategies for a Changing World: Report of the Expert Group Established to Support the Further Development of an EU International STI Cooperation Strategy. by Sylvia Schwaag Serger (Expert Group Chairperson) and Svend Remoe (Rapporteur). <https://data.europa.eu/doi/10.2777/18000>
5. Krishna, V. V. & Mishra, R. (2016). Indigo Policy Brief: India Science and Technology Cooperation with EU and Other Select Countries.
6. Desai, P.N. (1997). *Science Technology and International Cooperation*. HarAnand Publications, New Delhi.
7. Mattoo, Aaditya & Stern, Robert M. (Eds.) (2003). *India and the WTO*. World Bank Publications.
8. Fatheuer, Thomas (2016). *Disputed Nature: Biodiversity and Its Conventions*.
9. Singh, A., & Zammit, A. (2019). Globalisation, Labour Standards and Economic Development. In: *The Handbook of Globalisation*, Third Edition. Edward Elgar Publishing, pp. 202-224.
10. Weber, S., & Bussell, J. (2005). Will Information Technology Reshape the North-South Asymmetry of Power in the Global Political Economy? *Studies in Comparative International Development*, 40, 62-84.
11. Original Policy Documents. DST R&D Statistics (various years) DST website.

6. Science Policy and Economic Development:

- Technological Capability; Technology Transfer; Appropriate Technology.
 - Scientists' migration. Globalisation of Innovation.
 - Regulation of International Collaborations.
 - Discourses on Policy transfer across countries
- **Essential Readings:**

1. Stewart, Frances (2016). *Technology and Underdevelopment*. Springer.
2. Stewart, Frances (1987). The case for Appropriate Technology: A Reply to RS Eckaus. *Issues in Science and Technology*, 3(4), 101-109.
3. Lall, Sanjaya (1987). *Learning to Industrialize: The Acquisition of Technological Capability by India*. Springer.
4. Freeman, Chris (1989). *Technology Policy and Economic Change*. London: Pinter.

(Additional references will be given in class by S Bhaduri, R Sony and M Govind)

7. Recent Issues in Science Policy

- Industry-University collaborations
- Regulation and Standards
- Inclusive Policymaking: Participation in policy making
- S&T and Sustainability

- Public Procurement as Innovation Policy
- Cyber security and Data protection laws

• **Essential Readings:**

1. Edquist, C., & Zabala-Iturriagoitia, J. M. (2012). Public Procurement for Innovation as Mission-Oriented Innovation Policy. *Research Policy*, 41(10), 1757-1769.
2. Bhaduri, S., & Sharma, A. (2014). Public Understanding of Participation in Regulatory Decision-Making: The Case of Bottled Water Quality Standards in India. *Public Understanding of Science*, 23(4), 472-488.
3. Kalantaridis, C., Küttim, M., Govind, M., & Sousa, C. (2017). How to Commercialise University-Generated Knowledge Internationally? A Comparative Analysis of Contingent Institutional Conditions. *Technological Forecasting and Social Change*, 123, 35-44.

(Additional references will be given in class by S Bhaduri, M Govind and R Sony)

8. Role of Science and Technology on Human Health

- Healthcare Sector in India: Policy, Structure, Roles and Functions
- Drug development and approval process India
- National Health Research policy and Clinical research infrastructure in India

• **Essential Readings:**

1. Burns, L. R. (Ed.). (2014). *India's Healthcare Industry: Innovation in Delivery, Financing, and Manufacturing*. Cambridge University Press.
2. Central Drugs Standard Control Organization, Ministry of Health and Family Welfare, Government of India (2020). Notice regarding the Conduct of Clinical Trials in Present Situation due to Outbreak of COVID-19.
3. Department of Biotechnology, Ministry of Science & Technology, Government of India (2020). Rapid Response Regulatory Framework for COVID-19.
4. Dikshit, M. (Ed.). (2021). *Drug Discovery and Drug Development: The Indian Narrative*. Springer Nature.
5. Guarino, R. A. (2009). New Drug Approval Process. *Drugs and the Pharmaceutical Sciences*, 100.
6. Mehta, P. (2018). Framework of Indian healthcare system and its challenges: an insight. In *Health Economics and Healthcare Reform: Breakthroughs in Research and Practice* (pp. 405-429). IGI Global.
7. Ministry of Health and Family Welfare, Government of India (2017). *National Health Policy 2017*.
8. Ministry of Health and Family Welfare, Government of India (2011). *National Health Research Policy 2011*.
9. Ng, R. (2015). *Drugs: From Discovery to Approval*. John Wiley & Sons.
10. Purohit, B. C. (2020). *Economics of Public and Private Healthcare and Health Insurance in India*. Sage Publications, India.
11. Sen, F. (2009). *Drug Discovery and Development: Business Opportunities in India*. FCCI, New Delhi.
12. World Health Organization (2020). *Ethical Standards for Research During Public Health Emergencies: Distilling Existing Guidance to Support COVID-19 R&D* (No. WHO/RFH/20.1). World Health Organization.
13. World Health Organization (2020). *Guidance for research ethics committees for rapid review of research during public health emergencies*.