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SCHOOL OF INTERNATIONAL STUDIES
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जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
अंतरराष्ट्रीय अध्ययन संस्थान
SCHOOL OF INTERNATIONAL STUDIES

Programme:	M.A. – PISM
Course No:	IS 490 N
Course Title:	Science, Technology and International Relations: Civilizational Perspectives from India
Course Type:	Optional
Semester:	Monsoon
Course Teacher & Contact Details:	Name: Dr Sabareesh.P.A, Assistant Professor. Room no: #129, CCPPT, First Floor, SIS-1, JNU Email: sabareesh.jnu@gmail.com ; sabareesh@jnu.ac.in
Credits:	4
Contact Hours:	4 hours / week

Course Statement

Through the understanding of myriad interconnections between science, society and politics from the lens of Indian Knowledge Systems, this course examines the origins and foundations of science and technology beyond Eurocentric and western framework in the arena of international relations. The course highlights India's civilizational contributions to global knowledge. Science and technology evolve within the broader ambit of society, culture and civilization, reflecting the aspirations, values and ambitions for a polity. The course examines science as a dynamic process led by society and its intercultural interactions. It highlights India's contribution to scientific thought, philosophy, medicine, mathematics and technological traditions along with their implications on polity, economy, society, culture and global order since ancient times. The transmission and diffusion of knowledge during the ancient and medieval times from India to the west, enroute Arab lands, will be discussed using important case studies and travelogues. The course will also critically engage with colonial disruptions, destruction of indigenous educational systems, imperial thwarting of Indian Knowledge Systems and its postcolonial recovery of a grand civilization from the colonial trauma. The course then goes on to assess how subsequently India uses science and technology in knowledge diplomacy world over, and its attempt to make progress in terms of global order.

Course Objectives

1. To critically understand history of science, technological power, and global order.

2. To interpret India's scientific traditions from an IKS perspective and their links to international relations.
3. To examine the disruptions during European colonialism and its postcolonial recovery.
4. To introduce and interpret science diplomacy and technological sovereignty from civilizational, social, cultural, political, economic and international relations perspectives.
5. To understand science as a socio-political discipline and civilizational force.

Learning Outcomes

1. Knowledge Gained: -

- Basic understanding that science and technology are a part of social progress that has political, military and economic repercussions.

2. Skill Gained: -

- Analyze science diplomacy in geopolitics.
- Explain science as a civilizational and political process.

3. Competency Gained: -

- Differentiate differences between Indian Knowledge Systems and colonial knowledge.
- Evaluate the process of decolonization of knowledge systems.
- Understanding the prospects of Indian Knowledge Systems in diplomacy and international relations.

Evaluation Methods

1. Mid semester evaluation (50%)

- Internal Assignment – 30%
- Examination – 20%

2. End-semester evaluation (50%)

- End Semester Examination – 50 %

Course Outline

Module 1: Science, Technology and International Relations

1. History of Science, knowledge production and world order
2. Interconnectedness and integration of science, philosophy, values and culture
3. Science as a civilizational achievement, strategic resource and political power
4. Science, technology, cooperation and progress

Module 2: Indian Knowledge System: Traditions and Scientific Achievements

1. Harappan civilization, Vedic sciences and scientific knowledge traditions in India
2. Transdisciplinary knowledge generation in ancient and medieval India
3. Achievements in various avenues of science
4. Knowledge dissemination and civilizational linkage

Module 3: Knowledge Networking and Diplomacy in Ancient India

1. Knowledge diffusion during ancient and medieval India
2. Case studies of knowledge diffusion through travelogues, exchanges and dialogue
3. Traces of knowledge transmission from India → Arabia → Europe
4. Technology and diplomacy

Module 4: Science, Technology, Ethics, Dharma and Education in India:

1. Dharma, ethics and science in knowledge production
2. Moksha (enlightenment/ liberation) through knowledge
3. Indigenous education models and institutions (Gurukulas, ashrams, patshalas, matts, temples, viharas, Nalanda, Takshashila, Vikramshila)
4. Gandhian and Tagorean view of science

Module 5: Colonial Science, Intellectual Imperialism and Knowledge Politics

1. Colonial science policy and intellectual imperialism
2. Science as a colonial tool of knowledge suppression and supremacy assertion
3. Science, nationalism, non-alignment and self-reliance
4. Science diplomacy and technology sovereignty in independent India

Readings

Module 1: Science, Civilization and World Order

Essential Readings:

1. Basalla, G. (1967). *The Spread of Western Science*. *Science*, 156(3775), 611–622.
<https://doi.org/10.1126/science.156.3775.611>
2. Bernal, J. D. (1969). *Science in History* (Vols. 1–4). MIT Press. <https://mitpress.mit.edu>
3. Durant, W. (1954). *Our Oriental Heritage* (The Story of Civilization, Vol. 1). Simon and Schuster. <https://archive.org/details/in.gov.ignca.21085>

4. Joseph, G. G. (2011). *The Crest of the Peacock: Non-European Roots of Mathematics*. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691135267>
5. Needham, J. (1954). *Science and Civilization in China* (Vol. 1). Cambridge University Press. <https://www.cambridge.org/core/books/science-and-civilisation-in-china/>
6. Sabareesh, P. A. (2021). *A Brief History of Science in India*. Garuda Prakashan. <https://garudabooks.com>
7. Sabareesh, P. A., & Sony, A. L. R. (2022). *Science and Knowledge as a Tool of Subjugation: Perspectives of European colonialism in India*. *Journal of Scientific Temper*, 10(3), 177–190. <https://nopr.niscpr.res.in/index.php/JST/article/view/59793/465481585>
8. Sivin, N. (1995). *Science in Ancient China: Researches and Reflections*. Variorum. <https://www.routledge.com>

Additional Readings:

1. Alatas, S. F. (2006). *Alternative Discourses in Asian Social Science: Responses to Eurocentrism*. SAGE Publications. <https://in.sagepub.com>
2. Bala, A. (2012). *The Dialogue of Civilizations in the Birth of Modern Science*. Palgrave Macmillan. <https://link.springer.com/book/10.1057/9781137031730>
3. Clark P, O’Hear A. *Popper on Determinism*. In: *Karl Popper: Philosophy and Problems*. Royal Institute of Philosophy Supplements. Cambridge University Press; 1996:149-162. <https://www.cambridge.org/core/books/abs/karl-popper/popper-on-determinism/8684F79D91F0F384B543491D4F07EDF4>
4. Habib, I. (2011). *Medieval India: The Study of a Civilization*. National Book Trust. <https://www.nbtindia.gov.in>
5. Hobson, J. M. (2004). *The Eastern Origins of Western Civilization*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511483509>
6. Krige, J. (2006). *American Hegemony and the Postwar Reconstruction of Science in Europe*. MIT Press. <https://mitpress.mit.edu/books/american-hegemony-and-postwar-reconstruction-science-europe>
7. Nandy, A. (1988). *Science, Hegemony and Violence: A Requiem for Modernity*. Oxford University Press.

Module 2: Indian Knowledge System: Traditions and Scientific Achievements

Essential Readings:

1. Bag, A. K. (1979). *Mathematics in Ancient and Medieval India*. Chaukhamba Orientalia
2. Bhargava, Manjul. ‘*Musing on Music and Maths*’, *Madras Musings*, January 16, 2016,

- <http://www.madrasmusings.com/vol-25-no-19/musing-on-musicand-maths/>.
3. Bhargava, Manjul. *'India Has to Be Its Own Cultural Ambassador, But It Has to Be Scientific About It, The Wire*, accessed March 10, 2019, <https://thewire.in/history/india-has-to-be-its-own-cultural-ambassador-but-it-has-to-bescientific-about-it-manjul-bhargava>
 4. Dharampal, *Indian Science and Technology in the Eighteenth Century*, vol. 1, 5 vols, *Collected Writings of Dharampal*, Other India Press, Mapusa, Goa, 1971, <http://archive.org/details/IndianScienceAndTechnologyIntheEighteenthCentury>.
 5. Filliozat, J. (1964). *The Classical Doctrine of Indian Medicine*. Munshiram Manoharlal. <https://www.mlbd.com>
 6. Joseph, G. G. (2011). *The Crest of the Peacock: Non-European Roots of Mathematics*. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691135267>
 7. Kak, S. (2000). *The Astronomical Code of the Rigveda*. Munshiram Manoharlal. <https://www.mrmlonline.com>
 8. Rao, S. R. (1991). *Dawn and Devolution of the Indus Civilization*. Aditya Prakashan
 9. Ray, P. C. (1902). *A History of Hindu Chemistry*. <https://archive.org/details/historyofhinduch00rayp>
 10. Sabareesh, P. A. (2021). *A Brief History of Science in India*. Garuda Prakashan. <https://garudabooks.com>
 11. Sabareesh, P. A., & Sony, A. L. R. (2021). *Traditional Medicinal Knowledge System and Intellectual Property Rights: Scientific Validation of Tri-doshas in Ayurveda*. *Journal of Intellectual Property Rights*, 26(3), 146–161. <https://nopr.niscpr.res.in/handle/123456789/58037>
 12. Sabareesh, P. A., Pandey, A. C., & Kotecha, R. (2025). *Yoga as a Complementary Cancer Therapy for Mitigating Oncological Repercussions: A review*. *Indian Journal of Traditional Knowledge*, 24(11), 1011–1019. <https://or.niscpr.res.in/index.php/IJTK/article/view/19877/5095>
 13. Siddhartha J. *'The Harmony of Music, Mathematics And Sanskrit As Explained By Dr Manjul Bhargava'*, *Swarajya*, April 7, 2020, <https://swarajyamag.com/ideas/the-harmony-of-music-mathematics-and-sanskrit-as-explained-by-dr-manjul-bhargava>.
 14. Subbarayappa, B. V. (2013). *The Roots of Ancient Medicine: An Historical Outline*. Centre for Studies in Civilizations. <http://www.cscsarchive.org>

Additional Readings:

1. Arnold D. *Science, Technology and Medicine in Colonial India*. Cambridge University Press; 2000. <https://www.cambridge.org/core/books/science-technology-and-medicine-in-colonial-india/11078B2C9BF162E7417BCD70AAE73082>
2. Kangle, R. P. (2010). *The Kautiliya Arthashastra*. Motilal Banarsidass. <https://www.mlbd.com>

3. Olivelle, P. (2013). *King, Governance, and Law in Ancient India*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199891825.001.0001>
4. Seidenberg, A. (1978). *The Origin of Mathematics*. *Archive for History of Exact Sciences*, 18(4), 301–342. <https://doi.org/10.1007/BF00348404>

Module 3: Knowledge Networking and Diplomacy in Ancient India

Essential Readings:

1. Acharya, A. (2013). *Civilizations in Embrace: The Spread of Ideas and the Transformation of Power: India and Southeast Asia in the Classical Age*. ISEAS Publishing.
<https://www.cambridge.org/core/books/civilizations-in-embrace/413876687E1BC05BABEC9608442CFDF2>
2. Beal, S. (Trans.). (1884/2005). *Si-Yu-Ki: Buddhist Records of the Western World*. Munshiram Manoharlal. <https://archive.org/details/cu31924023029485>
3. Gibb, H. A. R. (Trans.). (1958). *The Travels of Ibn Battuta, A.D. 1325–1354*. Cambridge University Press. <https://archive.org/details/travelsofibnbatt00ibnuoft>
4. Hobson, J. M. (2004). *The Eastern Origins of Western Civilization*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511483509>
5. Joseph, G. G. (2011). *The Crest of the Peacock: Non-European Roots of Mathematics*. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691135267>
6. Legge, J. (Trans.). (1886/1965). *A Record of Buddhistic Kingdoms: Being an Account by the Chinese Monk Fa-Hien of his Travels in India and Ceylon (A.D. 399–414)*. Dover Publications.
<https://archive.org/details/recordofbuddhist00fahsuoft>
7. McCrindle, J. W. (Trans.). (1877/2010). *Ancient India as Described by Megasthenes and Arrian*. Cambridge University Press. <https://archive.org/details/ancientindiaasde00mc>
8. McNeill, W. H. (1963). *The Rise of the West: A History of the Human Community*. University of Chicago Press. <https://press.uchicago.edu>
9. Pollock, S. (2006). *The Language of the Gods in the World of Men*. University of California Press. <https://doi.org/10.1525/9780520932029>
10. Sabareesh, P. A. (2021). *A Brief History of Science in India*. Garuda Prakashan.
<https://garudabooks.com>
11. Sachau, E. C. (Trans.). (1910/2001). *Alberuni's India*. Routledge.
<https://archive.org/details/alberunisindiaac01biruoft>
12. Sen, A. (2005). *The Argumentative Indian*. Penguin Books. <https://penguin.co.in>

Additional Readings

1. Basalla, G. (1967). *The Spread of Western Science*. *Science*, 156(3775), 611–622.
<https://doi.org/10.1126/science.156.3775.611>
2. Basham, A. L. (1954). *The Wonder That Was India*. Picador.
<https://us.macmillan.com/books/9780330439091/thewonderthatwasindia>
3. Elman, B. A. (2005). *On Their Own Terms: Science in China, 1550–1900*. Harvard University Press. <https://www.hup.harvard.edu>
4. Goonatilake, S. (1998). *Toward a Global Science*. Indiana University Press.
5. Hobson, J. M. (2004). *The Eastern Origins of Western Civilisation*. Cambridge University Press.
<https://doi.org/10.1017/CBO9780511483509>
6. Raja Mohan, C. (2003). *Crossing the Rubicon: The Shaping of India's New Foreign Policy*. Palgrave Macmillan. <https://link.springer.com/book/10.1057/9780230505704>
7. Said, E. W. (1978). *Orientalism*. Pantheon Books. <https://penguinrandomhouse.com>
8. Sen, A. (2005). *The Argumentative Indian*. Penguin Books India.
<https://penguin.co.in/book/the-argumentative-indian/>
9. Schoff, W. H. (Trans.). (1912). *The Periplus of the Erythraean Sea*. Longmans, Green & Co.
<https://archive.org/details/periplusoferythr00schouoft>
10. Watters, T. (1904). *On Yuan Chwang's Travels in India*. Royal Asiatic Society.
<https://archive.org/details/onyuanchwangstr01wattuoft>
11. Yule, H. (Ed.). (1903). *The Book of Ser Marco Polo*. John Murray.
<https://archive.org/details/bookofsermarcopo01polo>

Module 4: Science, Technology, Ethics, Dharma and Education in India

Essential Readings:

1. Altekar, A. S. (1944). *Education in Ancient India*. Nand Kishore & Bros.
<https://archive.org>
2. Dharampal. (2000). *The Beautiful Tree: Indigenous Indian Education in the Eighteenth Century*. Other India Press. <http://www.otherindiapress.org.in>
3. Gandhi, M. K. (1938). *Hind Swaraj and Other Writings*. Navajivan Publishing House.
<https://www.gandhiheritageportal.org>
4. Joseph, G. G. (2011). *The Crest of the Peacock: Non-European Roots of Mathematics*. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691135267>
5. Keay, F. E. (1918). *Ancient Indian Education*. Oxford University Press.
<https://archive.org/details/ancientindianedu00keayuoft>
6. Mookerji, R. (1947). *Ancient Indian Education: Brahmanical and Buddhist*. Motilal Banarsidass.
<https://www.mlbd.com>

7. Nandy, A. (1988). *Science, Hegemony and Violence: A Requiem for Modernity*. Oxford University Press.
8. Olivelle, P. (2013). *King, Governance, and Law in Ancient India*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199891825.001.0001>
9. Sabareesh, P. A. (2021). *A Brief History of Science in India*. Garuda Prakashan.
<https://garudabooks.com>
10. Schumacher, E. F. (1973). *Small is Beautiful: Economics as if People Mattered*. Harper & Row.
<https://www.harpercollins.com>
11. Tagore, R. (1917). *Nationalism*. Macmillan. <https://archive.org/details/nationalism00tagouoft>

Additional Readings:

1. Altekar, A. S. (2009). *Education in Ancient India*. Isha Books.
2. Capra, F. (1982). *The Turning Point*. Simon & Schuster. <https://www.simonandschuster.com>
3. Gandhi, M. K. (1909/2009). *Hind Swaraj*. Navajivan Publishing House.
<https://www.gandhiheritageportal.org>
4. Ghosh, A. (Ed.). (1990). *An Encyclopedia of Indian Archaeology*. Munshiram Manoharlal
- Harding, S. (1998). *Is science multicultural?* Indiana University Press.
5. Mookerji, R. (2011). *Ancient Indian Education: Brahmanical and Buddhist*. Motilal Banarsidass.
<https://www.mlb.com>
6. Olivelle, P. (2013). *King, Governance, and Law in Ancient India*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199891825.001.0001>
7. Shiva, V. (1993). *Monocultures of the Mind*. Zed Books. <https://www.zedbooks.net>
8. Sen, A. (1999). *Development as Freedom*. Oxford University Press. <https://global.oup.com>
9. Sharma, R. S. (2005). *India's Ancient Past*. Oxford University Press. <https://global.oup.com>

Module 5: Colonial Science, Intellectual Imperialism and Knowledge Politics

Essential Readings:

1. Basalla, G. (1967). *The Spread of Western Science*. *Science*, 156(3775), 611–622.
<https://doi.org/10.1126/science.156.3775.611>
2. Chakrabarty, D. (2000). *Provincializing Europe: Postcolonial Thought and Historical Difference*. Princeton University Press. <https://doi.org/10.1515/9781400828657>
3. Cohn, B. S. (1996). *Colonialism and its Forms of Knowledge*. Princeton University Press.
<https://press.princeton.edu/books/paperback/9780691000435>
4. Dharampal. (2000). *The Beautiful Tree*. Other India Press. <http://www.otherindiaexpress.org.in>
5. Kumar, D. (1995). *Science and the Raj: A Study of British India*. Oxford University Press.

<https://global.oup.com>

6. Prakash, G. (1999). *Another Reason: Science and the Imagination of Modern India*. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691004525>
7. Sabareesh, P. A. (2021). *A Brief History of Science in India*. Garuda Prakashan. <https://garudabooks.com>
8. Visvanathan, S. (1985). *Organizing for Science: The Making of an Industrial Research Laboratory*. Oxford University Press.

Additional Readings:

1. Abraham, I. (1998). *The Making of the Indian Atomic Bomb: Science, Secrecy and the Postcolonial State*. Zed Books. <https://www.zedbooks.net>
2. Alvares, C. (1992). *Decolonizing History: Technology and Culture in India, China and the West*. Other India Press. <http://www.otherindiapress.org.in>
3. Cesaire, A. (2000). *Discourse on Colonialism*. Monthly Review Press. <https://monthlyreview.org>
4. Fanon, F. (1961). *The Wretched of the Earth*. Grove Press. <https://groveatlantic.com>
5. Habib, S. I., & Raina, D. (2004). *Social History of Science in Colonial India*. Oxford University Press. <https://global.oup.com>
6. Krige, J. (2006). *American Hegemony and the Postwar Reconstruction of Science in Europe*. MIT Press. <https://mitpress.mit.edu/books/american-hegemony-and-postwar-reconstruction-science-europe>
7. Nandy, A. (1988). *Science, Hegemony and Violence: A Requiem for Modernity*. Oxford University Press.
8. Raja Mohan, C. (2003). *Crossing the Rubicon: The Shaping of India's New Foreign Policy*. Palgrave Macmillan. <https://link.springer.com/book/10.1057/9780230505704>
9. Said, E. W. (1993). *Culture and Imperialism*. Vintage Books. <https://www.penguinrandomhouse.com>