## GENERIC ELECTIVES (GE-3): Indian Science and Technology

### Credit distribution, Eligibility and Pre-requisites of the Course

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| **Indian Science and Technology** | **4** | **3** | **1** | **0** | XII Pass | NIL |

### Learning Objectives

This course proposes to examine the interlinkages between science and technology with respect to society in India and its historical relevance and evolution. This paper is thematically arranged and provides a historical overview of Indian Science and Technology and acquaints students with historiographical debates. Further this paper takes a brief survey of the material culture as it evolved in Indian history. The students will study the evolution of agriculture in relation to the environment and animals. This paper will also explore the Indian contribution to the development of astronomy and mathematics, medicine, military and warfare technologies.

### Learning outcomes

The Learning Outcomes of this course are as follows:

- Critically understand the evolution of science and technology in India.
- Understand the interrelationship between science, technology and society.

### SYLLABUS OF GE-3

**Unit I:** Historiography of Science and Technology

**Unit II:** The Environment, Agriculture and Animals

**Unit III:** Mathematics and Astronomy: From Aryabhatta to Sawai Jai Singh

**Unit IV:** Patients, Doctors and Medicines

**Unit V:** Military and Warfare Technologies

**Practical component (if any) - NIL**

**Essential/recommended readings**

**Unit I:** In this unit students will understand the debates pertaining to the historiography of Science and Technology in India. They will also examine and explore the question why science did not flourish in India despite significant scientific developments. Factors like the prevalence of social inequality acting as a barrier to the development of scientific temperament and experimentation will be explored. **(Teaching Time: 3 weeks approx.)**

- Chattopadhyay, D.P. (1986). History of Science and Technology in Ancient India: The Beginnings, Calcutta: Farma KLM Pvt Ltd, pp. 1-54.
- मुले, गुणाकर. (२००५). भारतीतिहासमेंत वज्ञान. त िल्ली:र्ात्रीप्रकाशन. (अध्यार्:त वज्ञानऔरसमाि; पृष्ठ११-29, ज्योत तषकाआरिऔररवकास; पृष्ठ४१-49, वैत िकतगणतकीसमीक्षा; पृष्ठ५0--66).

**Unit II:** In this unit students will explore the process of human settlement, domestication of animals and transformation in the environment due to the advent of agriculture and introduction of new crops. **(Teaching Time: 2.5 weeks approx.)**

- Saxena, R.C. et al. (1994). A Textbook on Ancient History of Indian Agriculture. Secunderabad: Asian Agri-History Foundation (Chapter 5 Crop Domestication and Diffusion, pp. 29-36).

**Unit III:** This unit will trace the development of astronomical and mathematical sciences from Aryabhatta to Sawai Jai Singh. Students will be acquainted with the rich Indian heritage of astronomy and mathematics. **(Teaching Time: 3.5 weeks approx.)**

- Kochar, Rajesh and Jayant Narlikar. (1995). Astronomy in India: A Perspective, New Delhi: INSA, pp. 1-27.
- Bag, A.K. (1995). 'Mathematical and Astronomical Heritage of India' in D.P. Chattopadhyay et. al., Mathematics Astronomy and Biology in Indian Tradition: Some Conceptual Preliminaries, Delhi: Indian Council for Philosophical Research, pp. 110-128.

**Unit IV:** In this unit, students will delve into the diverse healing systems and practices in India. They will explore the emergence of a syncretic culture of health, healing practices and healers. **(Teaching Time: 3 weeks approx.)**

- Majumdar, R.C. (1971). 'Ayurveda: Origins and Antiquity', in D.M. Bose, Concise History of Science in India, New Delhi: Indian National Science Academy, pp. 213-216; 'Ayurveda and its Classical Division', pp. 227-234; 'Ayurveda in the Middle Ages', pp. 262-265.
- Arnold, David (2000). Science, Technology and Medicine in Colonial India, The New Cambridge History of India, Cambridge: Cambridge University Press, pp. 1-9.
- Nanda, Meera. (2016). Science in Saffron, Delhi: Three Essays (Chapter 3, 'Genetics, Plastic Surgery and other Wonders of Ancient Medicines', pp. 93-120).
- Alavi, Seema. (2008). Islam and Healing: Loss and Recovery of an Indo-Islamic Medical Tradition, 1600-1900. New Delhi: Permanent Black (Introduction).

**Unit V:** This unit will examine the emergence of new military technologies and how these changed the course of warfare techniques in medieval times. Further this unit will also explore the advance-ment of military technologies for colonial dominance in the Indian subcontinent. **(Teaching Time: 3 weeks approx.)**

- Khan, I.A. (2004). Gunpowder and Firearms: Warfare in Medieval India. New Delhi: Ox-ford University Press.
- Habib, Irfan. (2008). Technology in Medieval India 650-1750, New Delhi: Tulika, pp. 87- 98.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**