Course Code	Title of the Course	Course Structure	Pre-Requisite
	Indian Knowledge in Civilization Sciences and Engineering	**L-T-P: 3-1-0**	**NA**

Course Objectives:

1. To provide an overview of the foundational concepts of Indian Knowledge Systems and their relevance in the modern context of science and engineering.
2. To understand the history and culture of matter, astronomy, sun, earth, moon and vedic-mathematics.
3. To explore the historical developments in Indian civilization related to mathematics, astronomy, metallurgy, architecture, medicine, agriculture, etc.
4. To examine traditional Indian engineering practices and technologies, including dyes, paints, cements and environmental sustainability.
5. To establish connections between ancient Indian scientific principles and contemporary scientific and technological advancements.

Course Outcomes (COs):

By the end of this course, students will be able to:

1. **CO1:** Understand and articulate the core principles and philosophical ideas that form the basis of Indian civilization and knowledge traditions.
2. **CO2:** Describe major achievements in areas like mathematics, astronomy, metallurgy, medicine, architecture, agriculture, and water management.
3. **CO3:** Draw parallels and connections between ancient Indian science and modern engineering/scientific principles, promoting an integrated understanding.
4. **CO4:** Reflect on how Indian approaches promoted sustainability, harmony with nature, and ethical use of technology.
5. **CO5:** Propose solutions or design ideas inspired by traditional Indian knowledge systems, especially in sustainable engineering and development.

UNIT -I: Bhāratīya Civilization and Development of Knowledge System

Genesis of the land, Antiquity of civilization, On the Trail of the Lost River, Discovery of the Saraswatī River, the Saraswatī-Sindhu Civilization, Traditional Knowledge System, The Vedas, Main Schools of Philosophy (6+3), Ancient Education System, the Takṣaśilā University, the Nālandā University,Alumni, Knowledge Export from Bhārata.

UNIT-II: Arts, Literature, and Scholars

Art, Music, and Dance, Naṭarāja– A Masterpiece of Bhāratīya Art, Literature, Life and works of Agastya, Lopāmudrā, Ghoṣā, Vālmīki, Patañjali, Vedavyāsa, Yājñavalkya, Gārgī, Maitreyī, Bodhāyana, Caraka, Suśruta, Jīvaka, Nāgārjuna, Kaṇāda, Patañjali, Kauṭīlya, Pāṇini, Thiruvalluvar, Āryabhaṭa, Varāhamihira, Ādi Śaṅkarācārya, Bhāskarācārya, Mādhavācārya.

UNIT-III: Science, Astronomy, and Mathematics

Concept of Matter, Life and Universe, Gravity, Sage Agastya's Model of Battery, Velocity of Light, Vimāna: Aeronautics, Vedic Cosmology and Modern Concepts, Bhāratīya Kāla-gaṇanā, Kerala School for Mathematics and Astronomy, History and Culture of Astronomy, Sun, Earth, Moon, and Eclipses,Earth is Spherical and Rotation of Earth, Archaeostronomy; Concepts of Zero and Pi, Number System,Pythagoras Theorem, and Vedic Mathematics. Practical understating of Astronomical knowledge using modern virtual tools.

UNIT-IV: Engineering, Technology, and Architecture

Pre-Harappan and Sindhu Valley Civilization, Laboratory and Apparatus, Juices, Dyes, Paints and Cements, Glass and Pottery, Metallurgy, Engineering Science and Technology in the Vedic Age and Post-Vedic Records, Iron Pillar of Delhi, Rakhigarhi, Mehrgarh, Sindhu Valley Civilization, Marine Technology, and Bet–Dwārkā.

UNIT-V: Life, Environment, and Health

Ancient Knowledge in Life Science of Plants, Human Anatomy, Physiology, Agriculture, Ecology and Environment, Work of Maharshi Charak in Medicine and Aurveda, Mahrishi Shrushuta in Surgery. Emphasize the ancient knowledge in life environment and health in modern practices.

Text books:

1. Textbook on The Knowledge System of Bhārata by Bhag Chand Chauhan (2023) Garuda Prakashan.
2. Histrory of Science in India Volume-1, Part-I, Part-II, Volume VIII, by Sibaji Raha, et al. National Academy of Sciences, India and The Ramkrishan Mission Institute of Culture, Kolkata(2014).
3. Introduction to Indian Knowledge System: Concepts and Applications by B Mahadevan, N Pavana, VR Bhat (2022), PHI Publication.
4. Traditional Knowledge System in India by Amit Jha (2024)
   Atlantic Publishers and Distributors.
5.

Reference Books:

1. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al.Samskrit Bharati (2006).
2. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers (2012).
3. India's Glorious Scientific Tradition by Suresh Soni, Ocean Books Pvt. Ltd. (2010).