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|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Branch Name:</b>          | Bachelor of Computer Application (BCA)                                                                                                                                                                                                                                                                    |
| <b>Program Code:</b>         | CS101                                                                                                                                                                                                                                                                                                     |
| <b>Course Title:</b>         | Indian Knowledge System (IKS)                                                                                                                                                                                                                                                                             |
| <b>Course Code:</b>          | 21-MDE101-1C                                                                                                                                                                                                                                                                                              |
| <b>Pre-requisite Course:</b> | This course offers a comprehensive introduction to Indian Knowledge Systems (IKS), exploring foundational texts, philosophies, science, technology, and social sciences. It highlights India's traditional wisdom across disciplines like linguistics, astronomy, Ayurveda, governance, and architecture. |

### Course Objectives:

1. To introduce fundamentals of Ancient Indian Educations to understand the pattern and purpose of studying vedas, vedangas, upangas, upveda, purana & Itihasa.
2. To help students to trace, identify and develop the ancient knowledge systems.
3. To help to understand the apparently rational, verifiable and universal solution from ancient Indian knowledge system for the holistic development of physical, mental and spiritual wellbeing.
4. To build in the learners a deep-rooted pride in Indian knowledge, committed to universal human right, well-being and sustainable development.

### Teaching and Examination Scheme:

| Teaching Scheme (Hours. per week) |                 |                  |        | Evaluation Scheme (Marks) |            |                       |            |                       |            |                       |            |       |
|-----------------------------------|-----------------|------------------|--------|---------------------------|------------|-----------------------|------------|-----------------------|------------|-----------------------|------------|-------|
| Lecture<br>(L)                    | Tutorial<br>(T) | Practical<br>(P) | Credit | Theory                    |            |                       |            | Practical             |            |                       |            | Total |
|                                   |                 |                  |        | University Assessment     |            | Continuous Assessment |            | University Assessment |            | Continuous Assessment |            |       |
|                                   |                 |                  |        | Min. Marks                | Max. Marks | Min. Marks            | Max. Marks | Min. Marks            | Max. Marks | Min. Marks            | Max. Marks |       |
| 2                                 | -               | -                | 2      | 09                        | 25         | 09                    | 25         | -                     | -          | -                     | -          | 50    |

### Course Contents:

| Sr. No. | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Total Hours | Weightage (%) |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|
| 1       | <b>Introduction to IKS</b><br>Caturdaśa Vidyāsthānam, 64 Kalas, Shilpa Śāstra, Four Vedas, Vedāṅga, Indian Philosophical Systems, Vedic Schools of Philosophy ( Sāṃkhya and Yoga, Nyaya and Vaiśeṣika, Pūrva-Mīmāṃsā and Vedānta), Non-Vedic schools of Philosophical Systems (Cārvāka, Buddhist, Jain), Puranas (Maha-puranas, Upa-Puranas and Sthala-Puranas), Itihasa (Ramayana, Mahabharata), Niti Sastras, Subhasitas.                                                                                                                                                                                                                                                  | 8           | 25            |
| 2       | <b>Foundation concept for Science &amp; Technology</b><br>Linguistics & Phonetics in Sanskrit (panini's), Computational concepts in Astadhyayi Importance of Verbs, Role of Sanskrit in Natural Language Processing, Number System and Units of Measurement, concept of zero and its importance, Large numbers & their representation, Place Value of Numerals, Decimal System, Measurements for time, distance and weight, Unique approaches to represent numbers (Bhūta Saṃkhya System, Kaṭapayādi System), Pingala and the Binary system, Knowledge Pyramid, Prameya – A Vaiśeṣikan approach to physical reality, constituents of the physical reality, Pramāṇa, Saṃśaya. | 8           | 25            |

|          |                                                                                                                                                                                                                                                                                                                                                                |          |           |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| <b>3</b> | <b>Indian Science &amp; Technology in IKS</b><br>Indian S & T Heritage ,sixty-four art forms and occupational skills (64 Kalas)<br>Metals and Metalworking technology (Copper, Gold, Zinc, Mercury, Lead and Silver), Iron & Steel, Dyes and Painting Technology), Town & Planning<br>Architecture in India, Temple Architecture, Vastu Sastra.                | <b>7</b> | <b>25</b> |
| <b>4</b> | <b>Humanities &amp; Social Sciences in IKS</b><br>Health, Wellness & Psychology, Ayurveda Sleep and Food, Role of water in wellbeing Yoga way of life Indian approach to Psychology, the Triguna System<br>Body-Mind-Intellect- Consciousness Complex. Governance, Public<br>Administration & Management reference to ramayana, Artha Sastra, Kauṭilyan State. | <b>7</b> | <b>25</b> |

### Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO1: Understand the foundational framework of Indian Knowledge Systems** by exploring Caturdaśa Vidyāsthānam, the Vedas, Vedāṅgas, Puranas, Itihāsa, and traditional philosophies (Vedic and non-Vedic).
- CLO2: Demonstrate awareness of classical Indian philosophical schools** and their relevance to logic, metaphysics, ethics, and epistemology.
- CLO3: Explain key contributions of Sanskrit linguistics** including Panini's grammar and its computational aspects relevant to modern technologies like NLP.
- CLO4: Identify ancient Indian contributions to science and technology**, such as metallurgy, architecture, and crafts, and relate them to the 64 Kalās and Śilpa Śāstra.
- CLO5: Appreciate the Indian approach to health, wellness, and psychology**, focusing on Ayurveda, Yoga, and the Triguna framework.
- CLO6: Evaluate traditional models of governance and administration** as described in texts like the Artha Śāstra and the Rāmāyaṇa.
- CLO7: Develop a multidisciplinary understanding of IKS** that bridges philosophy, science, technology, and social systems for holistic knowledge integration.

### List of Text Book:

- "Introduction to Indian Knowledge Systems: Concepts and Applications"** – B. Mahadevan
  - Publisher: PHI Learning Pvt. Ltd.
  - A comprehensive textbook that integrates philosophy, science, arts, governance, and language systems from the IKS perspective.
- "Essentials of Indian Philosophy"** – M. Hiriyanna
  - Covers Vedic and non-Vedic philosophical systems like Sāṃkhya, Nyāya, Vedānta, Jain, and Buddhist thought.
- "The Vedas: An Introduction to Hinduism's Sacred Texts"** – Roshen Dalal
  - A readable overview of the Four Vedas and Vedāṅgas.
- "Panini: His Work and Its Traditions"** – George Cardona
  - In-depth look at Panini's Aṣṭādhyāyī and its linguistic and computational insights.
- "Mathematics in Ancient India"** – T.A. Sarasvati Amma
  - Covers Sulba Sutras, Aryabhata, and Indian contributions to arithmetic, algebra, and geometry.
- "Science and Civilization in India (Volumes I–V)"** – D.P. Chattopadhyaya (Ed.)
  - Encyclopedic references on Indian S&T heritage including metallurgy, medicine, town planning, and astronomy.
- "History of Science, Philosophy and Culture in Indian Civilization"** – Various volumes, edited by D.P. Chattopadhyaya
  - Deep-dives into knowledge systems, social sciences, and philosophical ideas.

### List of Reference Book:

1. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
2. Kapur K and Singh A. K (Eds) 2005). Indian Knowledge Systems, Vol. 1. Indian Institute of Advanced Study, Shimla. Tatvabodh of sankaracharya, Central chinmay mission trust, Bombay, 1995.
3. Nair, Shantha N. Echoes of Ancient Indian Wisdom. New Delhi: Hindology Books, 2008.
4. SK Das, The education system of Ancient hindus, Gyan publication house, India.
5. BL Gupta, Value and distribution system in india, Gyan publication house, India.
6. Reshmi ramdhoni, Ancient Indian Culture and Civilisation, star publication ,2018.
7. Supriya Lakshmi Mishra, Culture and History of Ancient India (With Special Reference of Sudras), 2020.
8. Gambirananda, Swami, Tr. Upanishads with the Commentary of Sankarachrya. Kolkata: Advaita Ashrama publication Department, 2002.
9. Ranganathananda, Swami. The Massage of the Upanishads. Bombay: Bharathya Vidya Bhaven, 1985.
10. Om Prakash, Religion and Society in Ancient India, Bhariya Vidhya Prakashan, 1985.
11. J Auboyer, Daily Life in Ancient India from Approximately 200 BC to AD 700, Munshi ram Manoharlal publication, 1994.
12. DK Chakkrabarty, Makkhan Lal, History of Ancient India (Set of 5 Volumes), Aryan book Internation publication, 2014
13. Dr. Girish Nath Jha, Dr. Umesh Kumar Singh and Diwakar Mishra, Science and Technology in Ancient Indian Texts, DK Print World limited.
14. Swami BB Vishnu, Vedic Science and History - Ancient Indian's Contribution to the Modern World, gosai publication, 2015
15. Chatterjee, S.C. The Nyaya Theory of Knowledge. Calcutta: University of Calcutta Press, 1950.
16. Dasgupta, Surendra. A History of Indian Philosophy. Delhi: Motilal Banarsidass, 1991. Vols. III & IV.
17. Mercier, Jean L. From the Upanishads to Aurobindo. Bangalore: Asian Trading Corporation, 2001.
18. M. Hiriyanna. Essentials of Indian Philosophy. London: Diane Publications, 1985.
19. Hume, Robert Ernest, Tr. The Thirteen Principal Upanishads. Virginia: Oxford University Press, 1931.
20. Radhakrishnan, S. Principal Upanishads. New York: Harper Collins, 1963.
21. Satprakashananda. The Methods of Knowledge according to Advaita Vedanta. Calcutta: Advaita Ashram, 2005.
22. Potter, K.H. Encyclopaedia of Indian Philosophies, Vol.III. Delhi: Motilal Banarasidass, 2000.

### List of Open-Source Software/learning website:

- **Learning Platforms & MOOCs**
- 1. **SWAYAM (<https://swayam.gov.in>)**
  - Offers IKS-related courses including “Introduction to Indian Knowledge Systems” by Prof. B. Mahadevan (IIT Madras).
  - Covers Vedas, Vedāṅga, Indian science, mathematics, and philosophy.
- 2. **Bharatiya Vidya Portal (<https://iksindia.org/>)**
  - Developed by the IKS Division, Ministry of Education (AICTE).
  - Repository of videos, articles, and initiatives on IKS themes such as Ayurveda, Yoga, Vastu, Itihasa, and more.
- 3. **Gyan Kosh (<https://gyankosh.ac.in>)**
  - A national digital knowledge repository supporting open learning in traditional Indian sciences and humanities.
- 4. **Indira Gandhi National Centre for the Arts (IGNCA) Digital Library (<http://ignca.gov.in>)**
  - Offers open-access manuscripts, documentation on Kalās, Śilpa Śāstra, Vedas, Puranas, and more.
- 5. **Digital Library of India (<https://www.dli.gov.in>)**

- Massive archive of scanned Indian classical texts in various Indian languages including Vedas, Ramayana, Mahabharata, Puranas, and works on Ayurveda and philosophy.
- 6. Sanskrit Documents (<https://sanskritdocuments.org>)**
- Collection of Sanskrit texts and translations, including Panini's Aṣṭādhyāyī, Subhāṣitas, and philosophical treatises.
- 7. National Digital Library of India (NDLI – <https://ndli.iitkgp.ac.in>)**
- Centralized repository with curated content on IKS: science, technology, language, philosophy, health, and governance.
- **Open-Source Software Tools**
- 1. Sanskrit Heritage Reader (<http://sanskrit.inria.fr>)**
- Developed by INRIA, this tool helps parse and analyze Sanskrit texts grammatically using Panini's rules.
- 2. Digital Corpus of Sanskrit (<https://www.sanskrit-linguistics.org/dcs/>)**
- A searchable corpus of annotated Sanskrit texts useful for NLP and linguistic research.
- 3. VEDIC (Visualizing Earth Data with Indian Concepts)**
- [Emerging tool] for visualizing traditional Indian astronomical models (pilot by IKS division or affiliated researchers).
- 4. KOSH – Online Sanskrit Dictionary Tools (<https://kosha.sanskrit.today/>)**
- Offers multilingual Sanskrit dictionaries and etymology useful for linguistic and phonetic study.
- 5. Computational Paninian Grammar Tools (CPanG) – [Academic Research Tools]**
- Used in university departments for parsing Sanskrit using computational logic derived from the Aṣṭādhyāyī.

### Mapping of CLO with PO and PSO

| Course Learning Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     |     |      |      |      | Program Specific Outcomes (PSOs) |      |      |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|----------------------------------|------|------|
|                          | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                             | PSO2 | PSO3 |
| CLO1                     | H                      | L   | H   | M   | L   | L   | L   | L   | L   | M    | L    | M    | M                                | H    | M    |
| CLO2                     | H                      | L   | H   | M   | L   | L   | L   | L   | L   | M    | L    | L    | L                                | H    | M    |
| CLO3                     | H                      | H   | H   | H   | M   | M   | M   | L   | M   | M    | M    | H    | H                                | M    | H    |
| CLO4                     | H                      | H   | H   | M   | M   | M   | H   | M   | M   | M    | M    | H    | H                                | M    | H    |
| CLO5                     | H                      | L   | H   | L   | L   | L   | L   | L   | L   | M    | L    | L    | L                                | H    | M    |
| CLO6                     | H                      | L   | H   | M   | L   | L   | M   | M   | M   | M    | L    | M    | M                                | H    | M    |
| CLO7                     | H                      | H   | H   | H   | M   | M   | M   | M   | M   | H    | M    | H    | H                                | H    | H    |

**H: High, M: Medium, L: Low**