

Master of Education (M.Ed.)

Title of the Course: S.Iks.2(w) : Ancient Indian Sciences: Unveiling Wisdom for Modern Education
(Semester: I, II, III & IV)

Credits: 4

MM: 100 (External: 70 Internal: 30)

Contact Week: 15

Introduction of the Course

This course delves into the ancient Indian sciences, emphasizing the relevance of mathematical, chemical, and life sciences in modern education. Through a thorough exploration of mathematical principles in Śulbasūtras, ancient chemical theories, metallurgical heritage, and life sciences, students will uncover the wisdom embedded in traditional Indian knowledge systems.

Learning Outcomes

After completion of the course, students will be able to:

1. Analyze mathematical principles in ancient Indian texts and their applicability.
2. Examine the chemical and metallurgical heritage of ancient India.
3. Evaluate the historical development and milestones in life sciences, agriculture, and ecology.
4. Apply the concepts of ancient Indian sciences to modern educational contexts.

Number of Units: 5

Weeks 15 = 60 hours

Unit 1: Foundations of Ancient Indian Mathematics

(3 weeks = 12 hours)

- Geometry in Śulbasūtras and construction methods
- Decimal place value system and different numeral systems

Unit 2: Advancements in Indian Mathematics

(3 weeks = 12 hours)

- Arithmetic and Trigonometry in Āryabhaṭīya and beyond
- Kuṭṭaka and continued fractions, Kerala School contributions

Unit 3: Chemical Theories and Metallurgical Heritage

(3 weeks = 12 hours)

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- Sāṅkhya-Pātañjala system and chemical analysis
- Chemical theories in Nyāya Vaiśeṣika and brahatsamhitā
- Metallurgical processes and concepts of acids and bases

Unit 4: Life Sciences, Agriculture, and Ecology in Ancient India (3 weeks = 12 hours)

- Historical development and milestones in Kṛṣiśāstra, vṛkṣāyurveda, and Mṛgāyurveda
- Concepts of Pākaśāstra and healthy diet

Unit 5: Application of Ancient Indian Sciences in Modern Education

(3 weeks = 12 hours)

- Relevance and application of ancient Indian sciences in the current educational context
- Projects and case studies on integrating ancient Indian knowledge into modern education

Practicum/ Suggested Projects / Assignments (Any Two)

1. Analyze and recreate geometric constructions from Śulbasūtras.
2. Investigate the metallurgical processes described in ancient texts.
3. Develop a presentation on the historical development of Kṛṣiśāstra and vṛkṣāyurveda.
4. Explore the medicinal properties of sacred groves and ayurvedic herbs.
5. Design a project showcasing the application of ancient Indian sciences in modern education.

Note: On the basis of the above, the teacher may design his/her own relevant projects/ assignments.

Essential/ Recommended Readings

- Anand, J. (2004). Psychological Healing and Faith in the Doctrine of Karma. *Psychology: The Indian Contribution National Conference on Indian Psychology, Yoga and Consciousness*. Retrieved from <https://ipi.org.in/texts/ipyc/ipyc-full/jyotianand.php>
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- Kumar Gyanender, (March 2021,) *Bharatiya Manovigyan men Budhdi ki Avadharana*, Shodh Prabha(Research Journal), S.L.B.S.R.S. Vidyapeeth New Delhi
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- John F Price, *Applied Geometry of the Sulba Sutras in Geometry at Work*, ed. C. Gorini, MAA, Washington DC, 2000.
- Clark, W. E. (1930). *The Aryabhata of Aryabhata: An ancient Indian Work on Mathematics and Astronomy*.
- Ray, P. (1956). *History Of Chemistry in Ancient and Medieval India*. Indian Chemical Society.
- Rao, S. B. (2016). *|| Parasaratanttra|| Ancient Sanskrit Text on Astronomy and Natural*

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- Govindan, K. Ī., Sharma, V. M., & Rāṣṭrīyasaṃskṛtavidyāpīṭhaṃ, T. (2005). Ancient Indian Science and Its Relevance to the Modern World. Rashtriya Sanskrit Vidyapeetha. <https://books.google.co.in/books?id=cvUKPwAACAAJ>

Additional Readings

- Cornelissen, M. (2011). Foundations of Indian Psychology Volume 2: Practical Applications. Pearson Education India.
- Kumar Gyanender (2019) Bahraty Manovigyan; Ak Samikshatmak Vishleshan, Sanskrit vimarsh (Research Journal), Kendriy Sanskrit Sansthan New Delhi.
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Teaching Learning Resources (Digital and others): Across Units (If any)

- Online databases for access to ancient mathematical texts.
- Digital repositories of ancient Indian chemical and metallurgical texts.
- Multimedia presentations on life sciences, agriculture, and ecology in ancient India.

Teaching Learning Process

- Interactive lectures on mathematical principles and applications.
- Group discussions on chemical and metallurgical heritage.
- Seminars and workshops on life sciences, agriculture, and ecology.
- Case study analysis and critical debates on the relevance of ancient Indian sciences.
- Guest lectures by experts in the field of ancient Indian sciences.

Assessment Method

- Written examinations on mathematical principles and historical developments.
- Research-based assignments on the applications of ancient Indian sciences.
- Oral presentations on life sciences, agriculture, and ecology.
- Mid-term and final projects integrating multiple units.
- Class participation and engagement in discussions.

- Summative evaluation will be done through an end-semester examination.

Key Words: Śulbasūtras, Āryabhaṭa, Nyāya Vaisesika, Kṛṣiśāstra, Āyurvedika Medicine



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