

Semester VIII

Generic Electives (GE):

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical / Practice		
Contribution of Indian Knowledge System to Science, Engineering and Technology	4	3	1	0	NIL	NIL

Learning Objectives

The course presents a gainful insight to some of the areas of application of IKS in science, engineering and technology. The course presents to the students the origin of science and technology that they can relate, appreciate and explore further as per their interest.

Learning Outcomes

- Get used to the foundation of Sanskrit language in NLP
- Understand the important aspects of Indian Numeral Systems
- Understand the use of time, length and weight measurements in ancient India
- Identify the origin of modern day binary number system used in modern day computers
- Develop an awareness of contribution of Indian astronomy
- Develop familiarity of ancient Indian pursuits in various areas of science and technology

SYLLABUS

Theory:

Unit I: Natural language processing

Components of a language; Panini's work on Sanskrit Grammar; Phonetics in Sanskrit; Patterns in Sanskrit vocabulary; Computational concept is *Astadhyayi*; Logic for sentence construction; Importance of verbs; Role of Sanskrit in NLP (12 hours)

Unit II: Units of Measurements

The concept of zero and its importance; Large numbers and their representations; Place values of numerals; Decimal system; Different approaches to represent numbers; Measurements for time, distance and weights; Pingala's Binary mathematics (9 hours)

Unit III: Contributions in Astronomy

Historical developments of astronomy in India; Elements of Indian calendar; *Pancanga*- the Indian calendar system; *Aryabhatiya Sidhanta*; Distance and velocity of a planet; Apparent motions of the stars due to earth's motion; Parallax in solar eclipse; Visibility corrections; Eclipses of the sun and the moon; Astronomical instruments (12 hours)

Unit IV: Science and Engineering

Metal extraction processes of Au, Zn, Cu and its alloys, Fe, Hg, Pb, Ag; Apparatus used for extraction; Lost wax casting of artefacts; Irrigation and water management; Dyes and painting technology; surgical techniques; shipbuilding (9 hours)

References:

1. *Introduction to Indian Knowledge System: Concepts and Applications*, B. Mahadevan, V R Bhat, Nagendra Pavan R N, PHI Learning Pvt Limited, 2022.
2. *Ancient Hindu Science: Its impact on the Ancient and Modern worlds*, Alok Kumar; Jaico Publishing House, 2019.
3. *Aryabhataiya of Aryabhat* by K.S. Shukla and K.V. Sarma, Indian National Science Academy, New Delhi (1976)

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

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Understanding Public Health: Infection to Informatics (GE)	4	2	0	2	12 th Pass	Nil

Learning Objectives

The course introduces students to the fundamentals of Public Health with reference to Infectious Diseases and Informatics. The Covid-19 pandemic has taught us the importance of having a good public health system and this course will prepare the future generation for a better understanding of the threats of zoonotic diseases and corresponding public health measures. Apart from theoretical background in Zoonotic diseases, infectious diseases prevalent in our country, this course will delve into the fundamentals of outbreaks and infection through case studies, data analysis and health informatics.

Learning Outcomes

This course enables students to become responsible and aware citizens and to act promptly and systematically in future outbreaks and epidemics. Upon completion of the course the students would be able to: