

Course: IKS
Ancient Indian Mathematics

Semester: I	Credits: 2	Subject Code: BSIKS12301	Lectures: 30
--------------------	-------------------	---------------------------------	---------------------

Course Outcomes:

At the end of this course, the learner will be able to:

- CO1: Learn about history and contributions of Indian Mathematician.
- CO2: Learn various Sulbasutra and Acharya Pingala, meruprastara properties.
- CO3: Learn about square root and cube root techniques and techniques in arithmetic given and different number system and its history with decimal place value system.
- CO4: Learn solving Diophantine equation and Pell's equation and various developments in arithmetic, geometry, algebra and trigonometry.

Unit 1	15
<ul style="list-style-type: none"> • History of Ancient Indian Mathematicians. • Baudhayana's Śulbasūtras--Finding square root of 2, Pi value Geometrical development and constructions-circling a square, square of area equal to sum of areas of two squares, square of area equal to half of its area etc. • Decimal Place value system history and development, Bhutsankhyasystem, Roman Numbers etc. • Aryabhatiya • Pingala's Chandahsastra-Meru Matra, binomial expansion and Fibonacci sequence • Development of Geometry, Astronomy, Trigonometry-sine table • Progression, Squares and cubes, Names of Days, Areas and Volumes • Arithmetic of number 	

Unit 2	15
<ul style="list-style-type: none"> • History of Magic Square, Types and Narayan Pandita Magic Square. • Linear indeterminate equations (kuttaka) • Brahmasphutasidhanta-Second order indeterminate equation $x^2 - Dy^2 = 1$ (vargaprakrti) • The cyclic method (cakravala) • Solving various problem in algebra, arithmetic. 	

Reference Books (Texts)

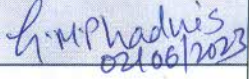
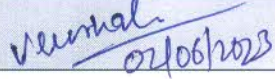

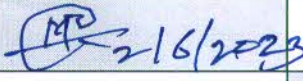
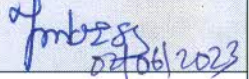

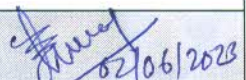
- Bibhutibhusan Datta and Avadhesh Narayan Singh, *History of Hindu Mathematics*, Part-I, Part I & II (HHM) Asia publishing House. Single volume edition. 1962
- Prof. . K. Abhyankar, *Aryabhata I, Ganitpada,*, Bhaskaracharya Pratishthan
- Prof. . K. Abhyankar, *Bhaskaracharya Bijganita and its Translation,* Bhaskaracharya Pratishthan
- Krishnaji Shankara Patwardhan, Someshankhara Amrita Naimpally, Shyam Lal

Board of Studies	Department	Name	Signature
Chairperson (HoD)	B.Sc. Computer Science	Gitanjali Phadnis	G. M. Phadnis 02/06/2023

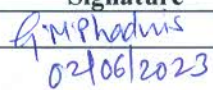


<p>Singh , <i>Lilavati of Bhakaracharya</i> ,Motilal Banarsidass,Fifth Edition.</p> <ul style="list-style-type: none"> • Venugopal D. Heroor, <i>The History of Mathematics and Mathematicians of INDIA</i>, Vidya Bharathi Karnataka, 2006. • Walter Eugene Clark, <i>The Aryabhatiya of Aryabhata</i>,D.K. Print World Ltd. 	
---	--

Websites:	
<ul style="list-style-type: none"> • https://archive.nptel.ac.in/courses/111/101/111101080/ 	

Board of Studies	Name	Signature
Chairperson (HoD)	Gitanjali Phadnis	 02/06/2023
Faculty	Vrushali Paranjpe	 02/06/2023
Subject Expert (Outside SPPU)	Dr. Prashant Malavadkar	 02/06/2023
Subject Expert (Outside SPPU)	Dr. Machchindra Gophane	 2/6/2023
VC Nominee (SPPU)	Dr. Borse Y. M.	 02/06/2023
Industry Expert	Ms. Jaina Shah	 02/06/2023
Alumni	Ms. Mamata Choudhary	 02/06/2023



Board of Studies	Department	Name	Signature
Chairperson (HoD)	B.Sc. Computer Science	Gitanjali Phadnis	 02/06/2023