## Course: IKS Ancient Indian Mathematics

Semester: I

Credits: 2

Subject Code: CIKS12301

Lectures: 30

## **Course Outcomes:**

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

- CO1- Describe the Mathematical discoveries of Ancient India.
- CO2- Correlate ancient mathematical methods with modern Mathematics.
- CO3- Interpret the landmark problems that lead to breakthroughs in mathematical practices.
- CO4- Solve modern day problems using ancient Mathematical tools.

Unit 1: Ancient Indian Mathematicians and their contributions	15
<ul> <li>History of Ancient Indian Mathematics</li> <li>Works of great Indian Mathematicians from Bodhyana, the first known geometer of India (800 BC) to Bhaskaracharya II (1114-1185)</li> </ul>	
<ul> <li>Indian decimal system and the names of place values from ancient times to</li> </ul>	
modern times	

## Unit 2: Arithmetic, Geometry and Algebra

15

- Arithmetic (Bhaskaracharya's Bijaganita): The 6 rules for positive and negative numbers, the 6 rules of zeros, the 6 rules for Algebraic numbers, six laws of surds, Equations of the form ax+c=by, a device to solve a quadratic equation
- Geometry: Bodhayana Theorem (Pythagoras Theorem), results in Geometry in Bodhayana Shulvasutras
- Aryabhata's Ganitpada: Decimal number systems of Aryabhata and Bhaskaracharya, Areas and volumes, Progressions, Squares and cubes, Rule of three, Names of Days (Aryabhatiya)



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## Reference Books:

- Ganitpada of Aryabhata I
- Lilavati of Bhaskaracharya
- Bhaskaracharya's Bijaganita and its translation, Prof. S. K. Abhyankar, Bhaskaracharya Pratisthana, Pune
- Aryabhatiya of Aryabhata

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