

A short course in Math History

The proposed 10-hour lecture course aims to cover some central ideas in:

[Module 1]: The History of Indian Mathematics. Here I will emphasise Indian mathematics as a continuous intellectual tradition rather than a collection of “results” to be measured against mathematics of other cultures.

[Module 2]: Indian Mathematics in the West. Exchanges with the Islamic world. Greek Geometry and number theory.

[Module 3]: History of developments of geometry leading to the classification of uniform polyhedra. Practical presentation on the common mathematical hobby of making paper models of polyhedra.

Module 1

Lecture 1: Mathematics in Vedic times. Sulba Satras. Mathematics in Classical Sanskrit Period.

Lecture 2: Decimal place value system. Negative numbers. Indian system of counting as the universal language. Work of Aryabhata.

Lecture 3: Mathematical astronomy. Indian contribution to Trigonometry and Astronomy. The work of Brahmagupta and Bhaskara.

Lecture 4: Kerala School of mathematics. The concept of Infinity. Infinite Series.

Module 2

Lecture 5: Exchanges with the Islamic world. Indian Mathematics in the West. Mathematics in Early western civilisations. The Pythagorean theorem.

Lecture 6: The Beginning of Greek Mathematics, Greek Geometry, Regular Polyhedra, Conic sections

Lecture 7: Developments in Greek Mathematics. Diophantine equations. Brahmagupta-Pell equation. Chinese remainder theorem.

Module 3

Lecture 8: Developments in Geometry.

Lecture 9: Platonic solids. Archimedean solids. Prisms. Antiprisms. Kepler–Poincaré polyhedra. Stellations. Classification of uniform polyhedra.

Lecture 10: Paper models. The work of Wenninger. The work of Coxeter on polyhedra.

About myself: My name is Amitabh Virmani. I am an Associate Professor at Chennai Mathematical Institute. I work on general relativity and string theory. I serve as an editorial board member of *General Relativity and Gravitation*, published by Springer International. I am also the head of a *Max Planck Partnergroup* with AEI Potsdam. I also teach at the *Indian Physics Olympiad* program. I have had a long-term scholarly interest in the history of science and mathematics. One of my hobbies is making paper models of polyhedra. I have had some formal training in the history of sciences through courses at IIT Kanpur. In 2020 I reviewed Kennefick’s book titled “No Shadow of a Doubt” on how Einstein become an overnight celebrity for the journal “Resonance.”