# A 12-Lecture Series of Math History

MATH4991 Independent Study with Dr. Roche

Harley Caham Combest

May 12 - August 1

## Ancient Mathematics (Weeks 1–4)

**Date Range: May 12 – June 6**

- **Week 1 (May 12–16): The Origins of Mathematical Thought**
  Chapters: 1 (Traces), 2 (Egypt), 3 (Mesopotamia)
  Topics: Number systems, early geometry, pragmatic mathematics
- **Week 2 (May 19–23): Hellenic Foundations**
  Chapters: 4 (Hellenic Traditions), 5 (Euclid)
  Topics: Deduction, proof, geometric idealism
- **Week 3 (May 26–30): Greek Mathematical Mastery**
  Chapters: 6 (Archimedes), 7 (Apollonius)
  Topics: Calculations, conics, scientific mechanics
- **Week 4 (June 2–6): Alexandrian Echoes and Decline**
  Chapter: 8 (Crosscurrents)
  Topics: Ptolemaic synthesis, late Greek and Byzantine continuity

## Medieval Mathematics (Weeks 5–7)

**Date Range: June 9 – June 27**

- **Week 5 (June 9–13): Parallel Flowerings – East and South Asia**
  Chapters: 9 (China), 10 (India)
  Topics: Rod numerals, trigonometry, infinite series (Keralese School)
- **Week 6 (June 16–20): The Islamic Golden Age**
  Chapter: 11 (Islamic Hegemony)
  Topics: Algebra, numeral transmission, astronomy
- **Week 7 (June 23–27): The Latin West Awakens**
  Chapter: 12 (Latin West)
  Topics: Fibonacci, translation movements, medieval kinematics

## Modern Mathematics (Weeks 8–12)

**Date Range: June 30 – August 1**

- **Week 8 (June 30–July 4): Renaissance to Pre-Calculus**
  Chapters: 13 (Renaissance), 14 (Early Modern)
  Topics: Algebra revival, symbolic notation, problem solving

- **Week 9 (July 7–11): Early Modern Analysis & Infinity**
  Chapter: 15 (Analysis and Synthesis)
  Topics: Cavalieri, Descartes, Pascal, Fermat
- **Week 10 (July 14–18): Newton, Leibniz, and the Calculus Wars**
  Chapters: 16 (British Techniques), 16 (Continental Methods)
  Topics: Newton vs Leibniz, Barrow, Bernoulli, rigor
- **Week 11 (July 21–25): Euler and the 18th Century Explosion**
  Chapter: 17 (Euler)
  Topics: Notation, number theory, analysis, probability
- **Week 12 (July 28–August 1): Foundations and Revolutions in the 19th–20th Centuries**
  Chapters: 18–24 (Overview)
  Topics: Gauss, Hilbert, Poincaré, Bourbaki, logic, computation, Fields Medals