AP Calculus AB (AP Calculus BC Part 1)

NOTE: The content of calculus proceeds in the sequence **Calculus 1,2 & 3** .

- **AP Calculus AB** is equivalent to Calculus 1.
- **AP Calculus BC** is equivalent to Calculus 1 and 2.
- **Multivariable Calculus** is equivalent to Calculus 3.

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TO REGISTER: **https://xumath.org**

WHEN, WHERE AND HOW MUCH?

Term: June 1 – Aug. 9, 2025

In-Person & Live Zoom Lectures: Sun. & Thu. 7-9pm CT

Recitation Video: Available on Canvas on Tue. & Sat.

In-Person Address: QD Academy, 4100 Legacy Drive, Suite 404, Plano, TX 75024
or 4116 W Spring Creek Parkway, Suite 500, Plano, TX 75024

Format:

- 20 2-hour lectures + 20 1-hour homework recitation videos
- 20 homework assignments (to be graded) + 2 exams (to be graded)
- A student can request the video of a class if the student has to miss the class.

Tuition: $990 (if register and pay by March 15), $1020 (after March 15)

WHO TEACHES?

Dr. Sheng Xu: Associate professor of math at Southern Methodist University

- Ph.D. from Cornell and post-doc at Princeton and Cornell
- 17 years and 15 math courses teaching experience
- Betty McKnight Spears Endowed Teaching Excellence Award in Math
- Recommendation by K-12 students and parents in anonymous testimonials on https://xumath.org/testimonial/
- Author of an undergraduate textbook *Introduction to Scientific Computing with Matlab and Python Tutorials*, Taylor Francis

COURSE INFO

Syllabus, Sample Notes and Videos: **https://xumath.org**

Required Textbook:

- **[1]** Customized notes by Prof. Xu (available before each class)
- **[2]** Calculus Volume 1 within the OpenStax project (free online or order print copies) https://openstax.org/details/books/calculus-volume-1

References:

- **[3]** R. Larson & B. Edwards, *Calculus Early Transcendental Functions*, Edition 6e, ISBN 1-285-77977-9
- **[4]** J. Stewart, *Essential Calculus Early Transcendentals*, 2nd Edition, ISBN 1-133-11228-5

TOPICS

Unit 1: Limits and Continuity

1. Preview of calculus and limits
2. Calculation of limits and continuity
3. Limits and asymptotes

Unit 2: Derivatives

1. Definition of derivatives
2. Differentiation rules and derivatives of elementary functions
3. The chain rule
4. Derivatives of inverse functions

Unit 3: Applications of Derivatives

1. Implicit differentiation and related rates
2. Linear approximation and differentials
3. Maxima, minima and the MVT
4. Curve sketching
5. Optimization problems
6. L'Hopital's Rule

Unit 4: Integration

1. Antiderivatives and indefinite integrals
2. Definite integrals
3. The fundamental theorem of calculus
4. Substitution rule

Unit 5: Applications of Integration

1. Area problems
2. Volume problems
3. Solving differential equations