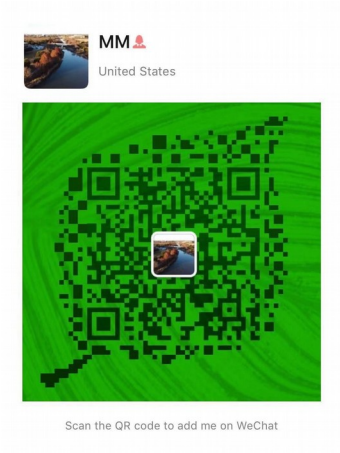
AP Calculus BC Part 2
(Calculus 2, after AP Calculus AB)



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.

CONTACT: 214-907-8310(M), shengxu.meimei@gmail.com,
webchat ID: tsinghua954251 (or scan the QR code)

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

WHEN AND WHERE?

Term: June 4 – Aug. 12, 2022
Video Lectures: 7-9pm (CT), Tue. & Sat.
Video Recitations: 7-8pm (CT), Mon. & Thu.
Live Virtual (via zoom) Q&A: 8-10am (CT), Fri
Format:

- 20 2-hour video lectures + 20 1-hour video homework recitations + 10 2-hour live Q&A
- 20 homework assignments (to be graded) + 4 exams (to be graded)
- A student can request the video of a class if the student has to miss the class.

Tuition: $799 (if register and pay by March 31), $830 (after March 31)

WHO TEACHES?

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

- Received Ph.D. from Cornell and did post-doc at Princeton and Cornell;
- Taught 11 different math courses at SMU in past 15 years;
- Received Betty McKnight Spears Endowed Teaching Excellence Award
- Recommended by K12 students and parents in anonymous testimonials on https://xumath.org
- To publish an undergraduate textbook *Introduction To Scientific Computing* with Taylor Francis, in press

COURSE INFO

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

- **[1]** Customized notes by Prof. Xu with reference to various textbooks (available before each class)
- **[2]** Calculus Volume 2 within the OpenStax project (free online or order print copies) https://openstax.org/details/books/calculus-volume-2
- **[3]** The Princeton Review, *AP Calculus BC Prep*, 2021 or 2022

References:

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

TOPICS

Unit 1: Techniques of Integration

1. Integration by parts
2. Trigonometric integrals
3. Partial fractions
4. Other integration techniques
5. Improper integrals

Unit 2: Differential Equations

1. Direction fields and numerical methods
2. Separable equations
3. The logistic equation
4. First-order linear equations

Unit 3: Sequences and Series

1. Sequences and series
2. Integral and comparison tests
3. Other convergence tests

Unit 4: Power Series

1. Power series
2. Representing functions as power series
3. Taylor and Maclaurin series
4. Applications of Taylor polynomials

Unit 5: Parametric Equations and Polar Coordinates

1. Parametric equations
2. Calculus of parametric curves
3. Polar coordinates
4. Areas and lengths in polar coordinates
5. Conic sections