2018 Advanced Placement® Calculus BC

About the AP® Calculus BC Summer Institute
This session is designed for both new and experienced teachers.

Special notes about this APSI workshop:
- Participants will be provided a notebook of activities, content review and exercises and resource references.
- Calculator technology will be used throughout the coursework.
- Content presentations will be linked to the Understanding by Design curriculum format and will emphasize the College Board’s Mathematical Practices for AP Calculus (MPACs).
- Homework problems will be assigned each night, a minimum 1 hour of teacher-invested time daily.

The tentative time line is as follows:

Day 1: June 18, 2018
Session 1
- Introductions
- College Board programs and services
- Resource materials overview
Session 2
- What’s new in AP Calculus for 2018-2019
- Interpreting/applying the Understanding by Design Curriculum Framework
- The Calculus BC curriculum
- Calculus reform teaching and questioning

Session 3
- Calculus course prerequisites
- Problems review
- Functions toolkit
Session 4
- Graphing:
  - Parametric curves
  - Vector-valued functions
  - Polar curves

Day 2: June 19, 2018
Session 1
- Homework overview
- Polar content review
- Calculator activities
- Classroom questioning/writing strategies
Session 2
- The Calculus of parametrics:
  - Differentiation
  - Tangent lines
  - Graphical analysis
• The Calculus of Vector-valued functions:
  o Differentiation
  o Motion studies
  o Distance and parametric arclength

Session 3
• The Calculus of Polar curves:
  o Differentiation
  o Tangent lines
  o Graphical Analysis
  o Area
  L'Hopital’s Rule
  Improper Integrals

Session 4
• AP problems review
• Reference reviews, textbook comparisons
• Software demos and on-line sources

Day 3: June 20, 2018
Session 1
• Continued sharing of references and teaching aides
• Pacing guideline discussion
• Integration by parts
• Sequences

Session 2
• Prerequisite content for series
• Infinite series convergence and divergence tests

Session 3
• More series convergence and divergence tests
• Problems practice in collaborative teams

Session 4
• Power series intervals of convergence
• Power series constructions and manipulations

Day 4: June 21, 2018
Session 1
• Homework and grading issues discussion
• Series problems review

Session 2
• Taylor and Maclaurin series
• Error analyses on series sums
• 2018 AP exam

Session 3
• Differential Equations:
  o Slope Fields
  o Analytical solutions with boundary conditions
  o Logistics and other real-world applications

Session 4
• More Differential Equations:
  o Euler’s Method
  o Calculator lab
• AP exams’ data review
• Summary and evaluation
**What to bring:**

Items you should bring during the week include:

- a laptop computer or tablet & storage device (not required, but certainly allowed for classroom use)
- the calculator you would use in class; some TI-84 and TI-89 calculators will be available for use during the institute through the Texas Instruments workshop loan program
- a current syllabus & pacing guide
- a copy of the textbook you will be using next year
- one classroom activity to share
- one best practice to share
- comfortable clothes and shoes for walking in the summer heat
- a light sweatshirt or sweater in case you get chilly in the AC
- Note: a survey will be sent to you a few weeks before the course begins – please be sure to provide your own email address (not a school administrator’s) so that you can respond in a timely manner.

**Instructor:**

**Benita Albert** has taught AP Calculus for 45 years at Oak Ridge High School in Oak Ridge, Tennessee. Now retired, she continues her consultant work with College Board and AP Calculus serving in numerous roles over the years as: an AP exam reader and table leader, a member of the AP Calculus Test Development Committee, an SAT question writer, author of the *AP Calculus Teacher's Guide* (1985), an AP workshop leader, APSI instructor and a member of both the Math Vertical Team and Building Success in Mathematics writing committees. She is the author of *Calculus Calculator Labs for Students*, and she has been honored to receive the College Board Service Award, the Presidential Award for Mathematics Teaching, a Tandy Technology Outstanding Teacher and selection to the 2007 USA Today All-American Teacher Team.