

**AP Summer Institute at Wake Forest University**

**BC Calculus**

**Dear AP Teacher,**

**I am so happy that you are coming to BC Calculus Camp! If you are new to teaching BC Calculus, have no fear. My goal for this workshop is to provide you with an overview of the BC course, as well as address content, strategies, and skills that increase student interest and knowledge. The topics are very "do-able", as well as interesting. You will be given lesson plans to assist you in presenting the material, as well as strategies for success. If you have already been teaching BC Calculus, it is my hope that you will come away with new insights and a deeper appreciation for the beauty of the material.**

**Please bring a graphing calculator, as well as any concerns about particular topics. I would like to "Taylor" our week to your needs. The entire BC curriculum will be thoroughly examined, as well as analysis of AP exam questions.**

**I am truly looking forward to working with you and sharing best practices.**

**Sincerely,**

**Phyllis Sprinkle**

**BC Syllabus: (The week will cover the following, but not be limited to this if there is a need to go further)**

**Integration Techniques**

- Integration by parts**
- Trig Substitution**
- Partial Fractions**
- Improper Integrals**
- L'Hopital's Rule and Indeterminate Forms**

**Differential Equations and Mathematical Modeling**

- Separable differential equations**
- Euler's Method and local linearization**
- Exponential growth and decay**
- Logistic growth**

**Parametric Equations and Vectors**

- Arc length, surface area (smooth and non-smooth surfaces)**
- First and second derivatives**
- Position/displacement/velocity/speed/acceleration**
- Vector-valued functions**
- Tangent lines**

**Polar Equations**

- Graphing, area, and area between two graphs**
- Length of a curve**
- Slope/horizontal and vertical tangent lines**

**Infinite Series**

- Sequences (convergence/divergence)**
- Series Converge/Diverge Tests**
- Maclaurin and Taylor Series**
- Radius and Interval of Convergence**
- Taylor Polynomial**
- Building a new series from a known series**
- Recentering a series**
- Error boundaries and approximating an infinite sum to desired accuracy**
- The Taylor Remainder Theorem**
- Alternating Series Remainder Theorem**
- Integration using a series with appropriate error boundary**