

Morehouse College
Math 327 (Applied Mathematics II)

Course Outline

1. Second order partial differential equations
 - (a) Classification
 - (b) Heat, wave, and potential equations
 - (c) Initial/boundary value problems
 - (d) Solutions by series and integral methods
 - (e) Complex numbers, variables, and regions in the plane
 - (f) Conformal mapping and applications to 2-dimensional potential problems

2. Green's function and identities
 - (a) Derivation of Green's function and its properties
 - (b) Green's identities and examples
 - (c) Applications of Green's identities to the uniqueness problem, the max-min principles, and continuous dependence on the data.

3. Special functions
 - (a) Series solutions about regular and regular singular points
 - (b) Legendre functions and properties
 - (c) Bessel functions and properties

4. Integral equations
 - (a) L^2 functions, L^2 norm, and convergence
 - (b) Volterra and Fredholm type integral equations
 - (c) methods of solution