

Marshall University

College of Science

Mathematics Department

## **MTH 443: Numerical Analysis**

### **Course catalog description**

The theory and technique of numerical computation involving the difference calculus, the summation calculus, interpolation methods, solutions of equations, and methods of solution of ordinary differential equations.

### **Credit hours**

3 hours

### **Prerequisites**

A grade of C or higher in MTH231.

### **List of topics**

- Floating point number systems
- Rates of convergence - algebraic and geometric
- Solution of nonlinear equations and nonlinear systems
- Introduction to numerical linear algebra: condition numbers, LU factorization, backward stability
- Basis functions: monomials, orthogonal polynomials, radial basis functions
- Interpolation methods
- Runge-Kutta methods for the solution of ODEs.

### **Suggested textbooks**

- *Numerical Analysis* by Sauer, ISBN 0321783670
- *Numerical Analysis: Mathematics of Scientific Computing* by Kincaid and Cheney, ISBN 0534389058

### ***Last updated***

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