

GEORGIA TECH LORRAINE  
GEORGIA INSTITUTE OF TECHNOLOGY  
School of Materials Science and Engineering  
ME 6795

Mathematical, Statistical, and Computational Techniques in Materials Science

**Course Objectives**

To learn the applications of mathematical, statistical, and computational techniques in Materials and Engineering Sciences.

**Books, handouts & other resources**

Advanced Engineering Mathematics, E. Kreyszig, Wiley.

**Course Outline**

1. Mathematical Techniques
  - a) Ordinary Differential Equations and Applications
  - b) Fourier Series and Applications
  - c) Partial Differential Equations and Applications
  - d) Rotations & Tensors and Applications
  - e) Optimization and Applications
2. Numerical and Computational Techniques
  - a) Numerical Methods and Applications
  - b) Computational Methods and Applications
  - c) Statistical Methods and Applications

**Learning Objectives**

**Course Outcomes:**

Outcome 1: The student will possess the fundamental knowledge and skills to solve problems related to computational physics and engineering. Furthermore, the student will function effectively in materials science and engineering- related positions in industry and government, or to successfully pursue advanced studies.

Outcome 2: The student will demonstrate technical competence using current engineering techniques, skills and tools.

**Grading**

The grade will be determined using the following weighting

Homeworks	10%
Midterm & Quizzes	60%
Final Exam or Project	30%

The final grade will be curved based on your attendance, performance and participation in class. Over two unexcused absences, no curving will be applied.