

KOC UNIVERSITY
 College of Engineering
 MECH 534 Computer-Based Modeling and Simulation
 Instructor: Cagatay Basdogan

Topics
1. Introduction (1 lecture)
What is this course about ?
2. Computer Programming (5 lectures)
What is a computer (1/2 lecture)
Algorithms and Computer Programming (1/2 lecture)
C Language (3 1/2 lectures)
Object Oriented Programming (1/2 lecture)
3. Numerical Analysis (6 lectures)
Introduction to Numerical Analysis (1 lecture)
Interpolation and Extrapolation (1/2 lecture)
Root Finding (1/2 lecture)
Numerical Integration (1/2 lecture)
Systems of Equations (1/2 lecture)
Eigenvalue Problems (1 lecture)
Ordinary Differential equations (2 lectures)
4. 3D Graphics and Simulation (4 lectures)
Introduction to Graphics Programming (1 lecture)
3D Modeling: shape, texture, and color (1 lecture)
3D Transformations (1 lecture)
Discrete Event Handling (1/2 lecture)
Discrete Event Scheduling (1/2 lecture)
5. Physics-Based Modeling (7 lectures)
Introduction to Physics-Based Modeling (1 lecture)
Rigid-Body Mechanics (1 lecture)
Particle Mechanics (1 lecture)
Handling Constraints (1 lecture)
Collision Detection (1 lecture)
Deformable Mechanics (2 lectures)
6. Probabilistic Modeling (3 lectures)
Random Variables (1 lecture)
Monte Carlo Methods (1 lecture)
Decision Analysis (1 lecture)