

Teaching Experiences

Joung Min (Jamie) Song

- Spring 2004 (RICE)
 - **Number Theory** - Introductory course in number theory. Topics include properties of integers, Euclidean algorithm, unique prime factorization, distribution of prime numbers, congruences, Fermat's little theorem, specialized primes, Chinese remainder theorem, diophantine equations, approximations of irrational numbers via Farey fractions, continued fractions, and introduction to elliptic curves
- Fall 2003 (RICE)
 - **Calculus of Several Variables** - Study of gradient, divergence, and curl, Lagrange multipliers, multiple integrals, and spherical coordinates, as well as line integrals, conservative vector fields, Green's theorem, Stokes's theorem, and Gauss's theorem
 - **Ordinary Differential Equations and Linear Algebra** - Study of ordinary differential equations (e.g., solutions to separable and linear first-order equations and to higher-order linear equations with constant coefficients, the properties of solutions to differential equations, and numerical solution methods) and linear algebra (e.g., vector spaces and solutions to algebraic linear equations, dimension, eigenvalues, and eigenvectors of a matrix), as well as the application of linear algebra to first-order systems of differential equations and the qualitative theory of nonlinear systems and phase portraits. Use of *Matlab*.
- Spring 2003 (RICE)
 - **Complex Analysis** - Study of the Cauchy integral theorem, Taylor series, residues, as well as the evaluation of integrals by means of residues, conformal mapping, and application to two-dimensional fluid flow
- Fall 2002 (RICE)
 - **Fundamental Theorem of Calculus** - First Course in Calculus for Non-science Majors. Topics include basic techniques of differentiation and integration with applications including curve sketching; anti-differentiation, the Riemann integral, fundamental theorem, exponential and circular functions
 - **Ordinary Differential Equations and Linear Algebra** (See Fall 2003)

- Summer 2002 (RICE)
 - **Calculus of Several Variables** (See Fall 2003)
- Spring 2002 (RICE)
 - **Calculus of Single Variable** - First course in calculus and analytic geometry; basic techniques of differentiation and integration with applications including curve sketching; anti-differentiation, the Riemann integral, fundamental theorem, exponential and circular functions
 - **Abstract Algebra** - Groups: normal subgroups, factor groups, Abelian groups. Rings: ideals, Euclidean rings, and unique factorization. Fields: algebraic extensions, finite fields
- Fall 2001 (RICE)
 - **Calculus of Single Variable**
- Spring 2001 (UIUC)
 - **Calculus and *Mathematica*** - First course in calculus and analytic geometry; in *Mathematica* lab. Students use Mathematica interface to learn concepts of calculus.
- Fall 2000 (UIUC)
 - **Differential Equations and *Mathematica*** - Intended for engineering students and others who require a working knowledge of differential equations; included are techniques and applications of ordinary differential equations and an introduction to partial differential equations
- Spring 2000 (UIUC)
 - **Calculus of Several Variables** - Third course in calculus and analytic geometry: three dimensional space, functions of several variables, partial derivatives, and multiple integrals
- Fall 1999 (UIUC)
 - **Numeracy** - Elementary course for students whose major interests are not in engineering or the physical sciences; emphasizes understanding of mathematical aspects of modern, real-world problems; includes concepts from combinatorics, exponential growth, probability and statistics; problem-solving strategies
- Spring 1999 (UIUC)
 - **Calculus and *Mathematica***

- Fall 1998 (UIUC)
 - **Calculus and Analytic Geometry II** - Second course in calculus and analytic geometry: techniques of integration, conic sections, polar coordinates, and infinite series.
- I have also taught:
 - **Calculus for Social Scientists** - First course in calculus aimed for social science majors. Topics are application oriented.
 - **Calculus and Analytic Geometry I** Similar to **Calculus of Single Variable** - also includes conics, Min-Max problems.
 - **College Algebra** - Rapid review of basic techniques of factoring, rational expressions, equations and inequalities; functions and graphs; exponential and logarithm functions; systems of equations; matrices and determinants; polynomials; and the binomial theorem Studies degrees and radians, the trigonometric functions, identities and equations, inverse functions, oblique triangles and applications;
 - **Calculus and Analytic Geometry - Harvard Style** - First course in Calculus taught in Harvard Calculus style small group setting. Students learn concepts of Calculus by exploring and discovering general theories by working on problems sets targeted to focus on specific topics. Discussions and sharing of ideas are especially encouraged among students.
- I had been a teaching assistant (at UIUC) for:
 - **Elementary Theory of Numbers** - Topics covered include divisibility, primes, congruences, quadratic reciprocity, and Farey sequences
 - **Introduction to Discrete Mathematics** - Beginning course on discrete mathematics, including sets and relations, functions, basic counting techniques, recurrence relations, graphs and trees, and matrix algebra; emphasis throughout is on algorithms and their efficacy
- I have been the organizer for the Current Mathematics Seminar (Graduate Seminar) for 5 semesters at the Rice University.