

**CHEM 6482**

**Fall 2012**

**SYLLABUS**

**Kinetics and Reaction Dynamics**

**Class Meetings:**

Monday, Wednesday and Friday, 11:05 – 11:55, Howey Physics (S107).

**Holidays:**

Sept. 3, 2012

Oct. 13-16, 2012

Nov. 22-23, 2012

**Credit Hrs: 3**

**Instructor:** Prof. Thomas M. Orlando

Office: G209C

Phone: (404) 894-4012

E:mail: [Thomas.Orlando@chemistry.gatech.edu](mailto:Thomas.Orlando@chemistry.gatech.edu)

**Office Hours:** By appointment

**Textbook:** Chemical Kinetics and Reaction Dynamics, Paul Houston.

**Description:** A course on the fundamental concepts and modern theoretical and experimental techniques in molecular reaction dynamics and chemical kinetics is offered. An emphasis will be placed on understanding gas-phase, gas-surface (solid), and liquid-solid reactions. Basic reaction rate theory, reactive scattering theory and transition-state theory will be covered. Specific examples to illustrate these concepts will be chosen from current research areas in atmospheric chemistry, surface physics and environmental science.

**Grading Policy:** The final grade will be based on graded class assignments and participation (25%), a short proposal (20%), a written mid-term (25%) and final exam (30%).

A T-square site will be established for the purpose of posting copies of the lectures.

**Schedule:** We will try to keep to the schedule below. However, there will be some adjustments as the course evolves. Class participation is expected, so the schedule will conform somewhat to the level of participation.

Aug. 20.	Course Introduction
Aug. 22-27	Kinetic Theory of Gases
Aug. 29-Sept. 5	Molecular Beam Techniques and Collision Dynamics
Sept. 7-17	Rates of Chemical Reactions
Sept. 19-21	Activated Collision Complex Theory
Sept. 24-28	Transition State Theory
Oct. 1-10	RRKM Theory
Oct. 12	<b>Midterm Exam (25% of Grade)</b>
Oct. 13-16	Student Recess
Oct. 17-26	Time Dependent Scattering Theory
Oct. 29-Nov. 5	Reactions at Aerosol/liquid Interfaces
Nov. 7-16	Reactions on Solid Surfaces
Nov. 16	<b>Short proposal due (20% of Grade)</b>
Nov. 19-21	Overview and work on Group Projects
Dec. 3-7	Present Group Projects
Dec. 10-14	<b>Final Exam (30% of Grade)</b>