**Chem 5570**

**Luminescence: Selected Topics in Analytical Chemistry**

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CHEM 143

TuTh 8:00AM - 9:15AM CHEM 411

Fall 2015



Scorpion fluorescing under a black light

Luminescence is beautiful and practical, and this course will introduce you to both aspects. The course is designed as an introduction and is for upper level undergraduates and graduate students. It starts from the bottom and works up to sophisticated measurements and applications. Topics to be covered will include:

Fluorescence and phosphorescence

Sources of luminescence

Luminescence of organic and inorganic molecules

Fluorescent proteins

Sequencing

Kinetics

Quenching

Energy transfer including FRET

Polarization (static and dynamic)

Excited state reactions

Instrumental methods

Steady state and time resolved measurements

Quantum yield determinations

Data analysis

Microscopy

Single molecule detection

Analytical applications

Sensors

Fluoroimmunoassay

Labeling

Ultralow-level detection

Environmental and bio-monitoring

The course is intended as a practical introduction to luminescence and photochemistry. Theory will be minimized. Topics can be tailored for the specific interests of the students.

Requirements: The student should have calculus and some basic physical chemistry. Familiarity with a fitting/graphing program such Excel is required.

The course will have homework, a written midterm, and a final, each followed by an oral exam over the material. Students will make a presentation on their choice of some aspect of luminescence or photochemistry.

The text will be the third edition of Joe Lakowicz’s *Principles of Fluorescence Spectroscopy*, literature readings, and internet material.

We will have lab tours of some the University facilities.