# ENV HLT 280
# Principles of Nanobiological Interactions & Nanotoxicology
# Fall 2007
# Subject Area: Environmental Health Sciences
**Tues/Thurs: 6:00 – 7:50 pm**

**Instructor of Record: Professor Eckhert Curtis D.**
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**Tel. Office # 310-825-8429**
**Lecture Day and Time: Tues/Thurs: 6:00 – 7:50 pm**
**Office Hours: Tues/Thurs: 4:00 – 5:00 pm**

Course Objectives:

- Introduce students to commonly used vocabulary in NanoScience that will required to appreciate the biological interactions and potential toxicity of nanomaterials
- Discuss synthesis and physical-chemical characterization of engineered nanomaterials
- Develop an understanding of unique properties of engineered nanomaterials and how these properties contribute to biological interactions
- Relate properties of engineered nanomaterials to their potential for transport, reactivity, uptake, and toxicity in natural environments and in the body.

Grading Structure:

- Mid term: Multiple choices (30 %) Every Professor contributes a few questions.
- Final: Multiple choices (35 %)
- Final report: (35 %)

Students are given a list of topics or lead to choose from at the beginning of the quarter.

Required Reading Material:

Thorough understanding of class lecture notes, hand outs and selected references that will be provided in individual lectures is highly recommended.

Fall Quarter begins: Monday, September 24, 2007; Instruction begins: Thursday, September 27, 2007

| | | Course Outline (3 units) | |
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| | **Date** | **Lecture (1.5 hours)** | **Faculty** |
| **Nanomaterials and Toxicology** | | | |
| 1 | 9/27/2007 | Lessons for Nanomaterial Safety From Chemical Toxicity | Curtis Eckhert |
| 2 | 10/2/2007 | Introduction to Nanomaterial Toxicity: Why Do We Need a Science? | Andre Nel |
| **Properties of Nanomaterials** | | | |
| 3 | 10/4/2007 | Nanoparticle Formation & Manufacture | Lutz Mäedler |
| 4 | 10/9/2007 | Physical and Chemical Properties of Nanomaterials | Jeffrey Zink, J. Fraser Stoddart & Bruce Dunn |
| 5 | 10/11/2007 | **Exam** | **NA** |
| 6 | 10/16/2007 | Exposure Assessment | Nola Kennedy & William Hinds |
| **Exposure Assessment and Physical-chemical Characterization** | | | |
| 7 | 10/18/2007 | Methods and Instrumentation for Detection of Nanoparticles | Lutz Mäedler& Eric Hoek |
| 8 | 10/23/2007 | Fate and Transport of Nanomaterials in Environmental Media (Air, Water, Soil) | Arturo Keller |
| 9 | 10/25/2007 | Impact of Nanomaterials on Ecosystems and Bacteria | Patricia Holden |
| **Nanomaterial Applications** | | | |
| 10 | 10/30/2007 | Nano-Bio Materials & Their Applications | Heather Maynard, Bruce Dunn & Lenny Rome |
| 11 | 11/1/2007 | Nanotechnology and Water Quality | Eric Hoek |
| 12 | 11/6/2007 | Life Cycle Assessment of Nanomaterials | Roland Geyer |
| **Cellular Toxicity** | | | |
| 13 | 11/8/2007 | Nanomaterial Uptake in Cells, Subcellular Distribution and Imaging | Lenny Rome, Andre Nel & Fuyuhiko Tamanoi |
| 14 | 11/13/2007 | Use of a Mechanism of Cellular Injury (Oxidative Stress) to Build a Predictive Toxicological Paradigm for Safety Assessment | Andre Nel |
| 15 | 11/15/2007 | Nanobiosensors and High Throughput Screening for Toxicological Assessment | Ken Bradley |
| 16 | 11/20/2007 | Forecasting Toxic Risk for the Nano Technology Industry | Lynne Zucker & Michael Darby |
| | 11/22/2007 | **Thanksgiving Holiday** | **NA** |
| **Risk Assessment, Management and Policy** | | | |
| 17 | 11/27/2007 | Risk Assessment | John Froines |
| 18 | 11/29/2007 | Risk Management and Public Policy | John Froines |

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| 19 | 12/4/2007 | Nanoparticles and Cancer | Robert Schiestl, Michael Teitell, William McBride & Oliver Hankinson |
| 20 | 12/6/2007 | **Review** | **NA** |

Exam Week: Final Exam (December 10-December 14, 2007)
November 22, 2007: Thanksgiving Holiday
Instruction ends: December 7, 2006