

AirUCI Summer 2006 Schedule

Monday, June 26th

9 am to 11 am: Room Rowland Hall 390

- Introductions
- Overview of the Summer AirUCI program by **Prof. Barbara Finlayson-Pitts**
- Introductions of all AirUCI faculty and associates
- Lecture by **Prof. J. Mickey Laux**
 - Overview of the atmosphere
 - Regions (p. 7), pressure and temperature variations (p. 8), inversions (p. 8 & 19) and composition (p. 3, 4, 7–9, 67–70 & 187)
 - Overview of common public environmental concerns

11 am to Noon: Lunch with some of the AirUCI faculty and researchers (provided)
(lunch is usually in the same room as the morning lecture)

Noon to 4 pm: Room RH 481 (and RH 350)

- Lab safety issues
- General tours of the analytical chemistry labs and AirUCI shared labs
- Simple demos of common lab techniques and principles
- Form lab groups of 3–4 people (20 attendees divided into 6 experiments) and set up rotation schedule amongst 6 experiments:
 1. HPLC of cigarette smoke
 2. GC/MS of gasoline vapor
 3. FTIR of ethanol content of vodka and mouthwash; Oil in soil
 4. UV/VIS studies of selected PAH carcinogenic compounds (possibly will be replaced by a different lab TBD)
 5. Ozone generation studies of common household items
 6. Contact angle measurements for water droplets on surfaces (NEW)
- Each group read the manual for their next day's lab

Tuesday, June 27th

9 am to 11 am: Room RH 390

- Lecture by **Prof. Donald Dabdub**
 - Basics of computer modeling and simulations
 - Specific applications to LA basin (p. 72–78 and 149–156 on LA Smog)
 - Global Circulation Models and Predictions (p. 212, 213 & 220 – 226)

11 am to Noon: Lunch with AirUCI faculty and researchers (provided)

Noon to 4 pm: Room MSTB 226A

- Computer Lab: Simulations of air pollution in the LA basin

Wednesday, June 28th**Note: late start on this day!!!! Everything is shifted by one hour.****10 am to 12 am: Room Rowland Hall 390**

- Lecture by **Prof. Doug Tobias**
 - Molecular structure
 - Fundamentals of molecular dynamics
 - Review of computational chemistry

12 pm to 1 pm: Lunch with AirUCI faculty and researchers (provided)**1 pm to 5 pm: Room MSTB 226B**

- Computer Lab: Chemistry on the computer

Thursday, June 29th**9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. Barbara Finlayson-Pitts**
 - Interaction of light with matter and environmental photochemistry (p. 9–12, 15–18, 67, 70–72, 161–163, 167 & 168)
 - Applications to the Chapman reactions (p. 18–26), CFC's (p. 49–56), and Ozone Depletion (p. 1–6, 12–15, 19, 20 & 27–52)
 - Chemistry of NO_x and Photochemical Smog (p. 66, 67, 72–82 and 149–156)

11 am to Noon: Lunch with AirUCI faculty and researchers (provided)**Noon to 4 pm: Room RH 481 (and RH 350)**

- Each team does their first wet lab experiment

Friday, June 30th**9 am to 10 am: Room Rowland Hall 390**

- Lecture by **Prof. Sergey Nizkorodov**
 - The use of light in analytical chemistry
 - Absorption of specific wavelengths by molecules; Beer's Law (p. 170–175, 185–187, 191 and 197–201)
 - Fluorescence, chemiluminescence (p. 299–301); ICP (p. 562–564)
 - Fingerprints in IR, higher absorption cross sections in UV
 - Atmospheric applications: long path FTIR
 - Greenhouse effect and greenhouse gases

10 am to 11 am: Room Rowland Hall 390

- Lecture by **Prof. J. Mickey Laux or Sergey Nizkorodov**
 - Fundamentals of Chromatography (p. 302–304 and 565–567)
 - An “inside view” of chromatographic instruments and a mass spectrometer

11 am to Noon: Lunch and free time on campus (teacher's own choice)**Noon to 4 pm: Room RH 481 (and RH 350)**

- Continue with the second wet lab experiment

Saturday, July 1st – Tuesday, July 4th**Independence Day break – no classes****Wednesday, July 5th****9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. Sergey Nizkorodov**
 - Particulate matter (PM10 and PM2.5) (p. 106–116)
 - Health risks of particulate matter (p. 116–127)
 - Light interaction with particulates (p. 202 & 203)
 - Aerosols: Composition and Effects on Global Warming (p. 107, & 203–206)
 - PAH (p. 393–402)
 - Combustion reactions and pollutant formation
 - Fuels: Hydrocarbons, Aromatics, H₂ (p. 283), Coal (p. 228 & 229), Petroleum and Gasoline (p. 229–231 & 267–271), Diesel (p. 267–269, 401 & 402)
 - Alcohols as Fuel (p. 272–280), MTBE (p. 280–282)
 - Leaded Fuel (p. 537–541)
 - Basic Organic Nomenclature (Appendix AP–1 through AP–14)

11 am to Noon: Lunch discussion of applications of material to their teaching (provided)**Noon to 4 pm: Room RH 481 (and RH 350)**

- Continue with the third wet lab experiment

Thursday, July 6th**9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. John Hemminger**
 - Fundamentals of surface science and environmental concerns at surface interfaces
 - Catalysts and catalytic converters (p. 83–88)
 - Seawater and sea salt aerosols (p. 452 & 453)
 - Heterogeneous SO₂ oxidation (p. 157–161) and PSC's (p. 36–39)

11 am to Noon: Lunch and free time on campus (teacher's own choice)**Noon to 4 pm: Room RH 481 (and RH 350)**

- Continue with the fourth wet lab experiment

Friday, July 7th**9 am to 11 am: Room Rowland Hall 390**

- Special Guest Lecture by **Prof. F. Sherwood Rowland** (Nobel Prize winner, 1995)
 - *Measuring trace gases around the world: CH₄ (p. 191–197), N₂O (p. 197–199), OH radical (p. 139), CFC's (p. 199–201) and implications for the atmosphere*
 - *Pollutant transport (p. 413–415)*

11 am to Noon: Lunch with AirUCI faculty and researchers (provided)

Noon to 4 pm: Room RH 481(and RH 350)

- Continue with the fifth wet lab experiment

Monday, July 10th**9 am to 11 am: Room Rowland Hall 390**

- Special Guest Lecture by **Dr. James Pitts, Jr.**
 - *Indoor air pollution (p. 127–135)*
 - *Risk assessment (p. 332–334)*
 - *Public health policy: Toxicology (p. 327–332)*

11 am to Noon: Lunch with AirUCI faculty and researchers (provided)

Noon to 4 pm: Room RH 481(and RH 350)

- Continue with the sixth wet lab experiment.

Tuesday, July 11th**9 am to 12 pm: Room Rowland Hall 390 (initially)**

- Guided tours of research labs of AirUCI Professors (split into small groups of 5 people)

12 pm to 2.30 pm: Lunch with AirUCI faculty and researchers (provided)

- Pairing of teachers and researchers.
- Discussion on future lab experiments
- Applications of lab topics and skills to everyone's classes
- Discussion on applications to the middle and high school
- Discussion of possible future AirUCI projects and topics