AirUCI Summer 2008 Schedule

Monday, June 30th

9 am to 11 am: **Room Rowland Hall 390**

- Overview of the AirUCI summer program by **Prof. Barbara Finlayson-Pitts**
- Introductions of all AirUCI faculty and associates
- Teachers introduce each other
- Administrative notes by Prof. Sergey Nizkorodov
- Lecture by **Prof. J. Mickey Laux**
  - Overview of the atmosphere: Regions (p. 28), pressure and temperature (p. 29), inversions (p. 29, 41) and composition (p. 28, 29, 59, 91–97, 218, 219 & 239)
  - Free radicals (p. 48, 92, 176 & 177) and Sinks (p. 77 & 178)
  - Overview of common public environmental concerns
  - Mathematics in chemistry review (p. 93 & 94 "Box 3–1")

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

12 pm to 2 pm: **Room RH 390**

- Lab safety issues (video)
- Form lab groups of 4 people (20 attendees divided into 5 experiments) and set up rotation schedule amongst the following 5 experiments
- Overview of wet labs by **Prof. S. Nizkorodov and Prof. J. Mickey Laux**
  1. Determination of PAH in cigarette smoke by HPLC
  2. Determination of MTBE and benzene in gasoline by GC/MS
  3. MTBE in gasoline and ethanol in vodka / mouthwash measured by FTIR
  4. Ozone generation and particle removal by air purifiers
  5. Laser–Induced Breakdown Spectroscopy (LIBS) of common metals
- Using Microsoft Excel for plotting on laptops

2 pm to 4 pm: **Room RH 481**

- General tours of the analytical chemistry labs and AirUCI shared labs
- Common lab techniques: pipetting, measuring volumes, mixing solvents, using syringes, safety, etc.

Tuesday, July 1st

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 and Beer's Law (p. 30, 31, 217, 218, 229, 242 & 245)
  - Fluorescence (p. 199–201)
  - Overview of the optical instrumentation used in the labs

10 am to 11 am: Room Rowland Hall 390

- Lecture by **Prof. J. Mickey Laux**
  - Fundamentals of Chromatography (p.398–401, 540–543 & 657–660)
  - An "inside view" of chromatographic instruments and a mass spectrometer

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

12 pm to 4 pm: **Rooms RH 481, RH 350, RH 354, RH385**

- Each team does their first wet lab experiment

Wednesday, July 2nd

9 am to 11 am: **Room Rowland Hall 390**

- Lecture by **Prof. Barbara Finlayson–Pitts**
  - Interaction of light with matter and environmental photochemistry (p. 30 & 37–40)
  - Applications to the Chapman reactions (p. 40–43), CFC's (p. 55, 77–85 & 244), and Ozone Depletion (p. 27, 32–36, 47, 48, 50–55, & 59–76)
  - Chemistry of NO_x (p. 75 & 100), Photochemical Smog and Tropospheric Ozone (p. 97–109, 156–160, 179–181, 185–191 & 245)

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

12 pm to 4 pm: **Rooms RH 481, RH 350, RH 354, RH385**

- Continue with the second wet lab experiment

Thursday, July 3rd

10 am to 12 pm: **Room Rowland Hall 390**
(shifted by 1 hour because of the PC lab availability issues)

- Lecture by **Prof. Doug Tobias**
  - Molecular structure and vibrations (p. 214–217)
  - 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

Friday, July 4th

Independence Day break – no classes

Monday, July 7th

10 am to 12 pm: **Room Rowland Hall 390**
(shifted by 1 hour because of the PC lab availability issues)

- Lecture by **Prof. Donald Dabdub**
  - Basics of computer modeling and simulations
  - Specific applications to LA basin (p. 97–109 on LA Smog)
  - Global Circulation Models and Predictions (p. 254 & 255)

12 pm to 1 pm: Lunch with AirUCI faculty and researchers (provided)

1 pm to 5 pm: **Room MSTB 226B**

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

Tuesday, July 8th

9 am to 11 am: **Room Rowland Hall 390**

- Lecture by **Prof. Sergey Nizkorodov**
  - Particulate matter (PM_{10} and $PM_{2.5}$) (p. 132–140)
  - Health risks of particulate matter (p. 155, 156 & 160–163)
  - Light interaction with particulates (p. 146, 246 & 247)
  - Aerosols: Composition and Effects on Global Warming (p. 133, & 246–251)
  - VOC's (p. 97) and Polycyclic Aromatic Hydrocarbons, PAH (p. 507–517)
  - Fuels: Fossil Fuels (p. 261–269), H_2 (p. 272–274 & 350–363), Coal (p. 124, 125, 129–132, 270 & 271), Petroleum and Gasoline (p. 274–281), Diesel (p.114 & 115)
  - Alcohols as Fuel (p. 333–345), MTBE (p. 345 & 346)
  - Leaded Fuel (p. 679 & 687–691)
  - Basic Organic Nomenclature (Appendix AP–1 through AP–14)

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

12 pm to 4 pm: **Rooms RH 481, RH 350, RH 354, RH385**

- Continue with the third wet lab experiment

Wednesday, July 9th

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. 18 & 109–114)
  - Sea salt aerosols
  - Heterogeneous SO_2 oxidation (p. 126–128) and PSC's (p. 64 & 65)

11 am to 12 pm: Lunch discussion of applications of material to their teaching (provided)

12 pm to 4 pm: **Rooms RH 481, RH 350, RH 354, RH385**

- Continue with the fourth wet lab experiment

Thursday, July 10th

9 am to 11 am: **Room Rowland Hall 390**

- Special lecture by **Prof. Benny Gerber**
  - The Hydrogen Bond in Chemistry (p. AP. 10 in the Appendix)

11 am to 12 pm: Lunch with AirUCI faculty, researchers (provided)

12 pm to 4 pm: **Rooms RH 481, RH 350, RH 354, RH385**

- Continue with the fifth wet lab experiment

Friday, July 11th

9 am to 12.30 pm: **Room Rowland Hall 390 (initially)**

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

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

- Pairing of teachers and researchers
- Early dismissal at 2:30 pm.