

AirUCI Summer 2005 Schedule

Monday, July 11th

9 am to 11 am: **Room Rowland Hall 306**

- Introductions
- Overview of the Summer AirUCI program
- Introductions of all AirUCI faculty and associates
- Lecture by **Dr. J. Mickey Laux**

Topics: 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
(lunch is provided by AirUCI; lunch is always in the same room as the morning lecture except on Thursdays)

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

- General tours of the analytical chemistry labs
- Lab safety
- Simple demos of common lab techniques and principles
- Form lab groups of 3–4 people (15–20 attendees divided into 5 experiments) and set up rotation schedule amongst 5 experiments:
 1. HPLC of cigarette smoke
 2. GC/MS of gasoline
 3. FTIR of ethanol content of vodka and mouthwash; Oil in soil
 4. UV/VIS studies of selected PAH carcinogenic compounds
 5. Ozone generation studies of common household items

Tuesday, July 12th

9 am to 11 am: **Room RH 306**

- Lecture by **Professor Donald Dabdub**

Topics: 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 226B**

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

Wednesday, July 13th

9 am to 11 am: ~~Natural Sciences I Building, Room 4112~~ **Changed to RH306!!**

- Lecture by **Professor Barbara Finlayson-Pitts**

Topics: 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**

- Each team does their first lab experiment

Thursday, July 14th

9 am to 10 am: **Room FRH 3034**

- Lecture by **Professor Barbara Finlayson-Pitts**

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

10 am to 11 am: **Room FRH 3034**

- Lecture by **Dr. J. Mickey Laux**

Topics: 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**

- Continue with 2nd lab experiment

Friday, July 15th

9am to 11 am: **Room RH 306**

- Lecture by **Professor Sergey Nizkorodov**

Topics: 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 possible applications of material covered to date to their teaching (provided)

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

- Continue with 3rd lab experiment

Monday, July 18th

9 am to 11 am: **Room RH 306**

- Lecture by **Professor Doug Tobias**

Topics: Molecular structure

Fundamentals of molecular dynamics

Review of computational chemistry

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

Noon to 4 pm: **Room MSTB 226B**

- Computer Lab: Chemistry on the computer

Tuesday, July 19th

9 am to 11 am: **Room RH 306**

- Lecture by **Professor John Hemminger**

Topics: 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 with AirUCI faculty and researchers (provided)

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

- Continue with 4th lab experiment

Wednesday, July 20th

9 am to 11 am: **Natural Sciences I Building, Room 4112**

- Special Guest Lecture by **Professor Emeritus & Researcher Jim Pitts**

Topics: Atmospheric chemistry and measurements of toxic air pollutants

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**

- Finish rotation to the 5th experiment

Thursday, July 21st

9 am to 11 am: **Room FRH 3034**

- Special Guest Lecture by **Professor Don Blake**

Topics: 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 and free time on campus (teacher's own choice)

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

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

Friday, July 22nd

9am to 11 am: **Natural Sciences I Building, Room 4112**

- Review of the 2 week summer session by **Dr. J. Mickey Laux**
- Group discussion on applications to the middle and high school
- Group discussion of possible future AirUCI projects and topics

11 am to 12:30 pm:

- Lunch with AirUCI faculty and researchers.

12:30 to 4 pm: **Natural Sciences I Building, Room 4112**

- Finish up any lab calculations and discussion
- Pairing of teachers and researchers.
- Group discussion on future lab experiments
- Applications of lab topics and skills to everyone's classes