What type of chemistry is important in understanding the chemistry of our environment?

- General Chemistry
- Physical Chemistry
- Organic Chemistry
- Inorganic Chemistry
- Biological Chemistry
- Analytical Chemistry
- Toxicological Chemistry

Where is chemistry occurring?

- Atmosphere
  - Structure and Composition of the Atmosphere
- Water
  - Surface Water
  - Ground Water
  - Oceans
- Soil
  - Structure of the soil

Physical Chemistry in the environment

- Thermodynamics
- Open and Closed Systems

- Equilibrium
  - Vapour Pressure and relative humidity
  - Henry's Law
  - pH
  - Solubility
  - Common ion effect
  - Complexation
- Activity
- Colligative Properties

- Chemical Kinetics
  - Rates of reaction
  - Elementary reactions
  - Non-elementary reactions
  - Reaction order
    - First order reactions
    - Second order reactions
    - Pseudo first order rate coefficients
    - Lifetimes
    - Sources
    - Sinks
    - Residence times and mixing times
  - Concentration effects in reaction rates
  - Competition between reaction
  - Energy changes in reactions
    - Endothermicity

- Exothermicity
- Temperature dependence of reaction rates
- Catalysis
  - Acid rain
  - Surface chemistry

- Photochemistry
  - Electromagnetic radiation
    - Absorption
    - Emission
  - Photolysis
  - Diurnal forcing
  - Annual cycles

- Global cycles
  - Energy cycle
  - Carbon cycle
  - Nitrogen cycle
  - Oxygen cycle
  - Hydrologic cycle
  - Phosphorous cycle
  - Sulfur cycle

- Atmospheric Chemistry
  - Constituents of the atmosphere
    - O_2
    - N_2
    - H_2O
    - CO_2
  - Stratospheric Chemistry
    - Ozone Chemistry
    - Greenhouse Effect
    - Tropospheric Chemistry
      - Role of free radicals
      - Chemistry of the natural atmosphere
      - Chemistry of the polluted atmosphere
        - What is a pollutant
        - Anthropogenic emissions and trends
        - Criteria pollutants
        - Persistence of pollutants
      - Radiation, Photochemistry, and Diurnal Forcing
      - Emissions, natural and anthropogenic
      - Smog
      - Transport
      - Deposition
      - Precipitation and role of hydrometeors
      - Role of Clouds
      - Acid Rain and Snow

- Water Chemistry

- Oceans
  - Chlorine Cycle
  - Sulfur Cycle
- Ground Water
  - Runoff
  - Leachates
- Surface Water
  - Rivers
    - Metal ion speciation and transport
  - Lakes
    - Acidity
    - Oxygen Levels
    - Phosphates
    - Nitrification and denitrification
- Precipitation

Soil Chemistry
- Minerals
- Nitrogen
- Emissions

Global Issues
- Greenhouse effect
- Montreal protocol
- Is there global warming?
- Data needs: Global Emissions Inventory Activity
- Research Strategies and Policy

Issues in indoor air quality