Agronomy 685 (Micro. 685).

Advanced Soil Biochemistry (2-0) Cr. 2. Alt. S. offered 2004. Prereq.: Agron. 585. or equivalent. Tabatabai. Chemistry of organic matter and biochemical transformations brought about by microorganisms and enzymes in soils.

Course Outline:

- Origin, nature, properties of soil organic matter
  - Origin
  - General chemistry and properties
  - Methods of investigation
  - Lignin-derived material
  - Nitrogen compounds
  - Phosphorus and sulfur compounds
  - Carbohydrates
  - Humic and Fulvic fractions
  - Reactive groups
  - Properties

- Interactions between microorganisms and soil particles
  - Estimate of microbial biomass
  - Estimate of microbial biomass C, N, P, and S

- Enzymes in soils
  - History
  - Origin
  - State
  - Biological significance
  - Extraction
  - Kinetic parameters
  - Thermodynamic parameters
  - Effects of metal ions
  - Effects of pesticides
  - Potential use and applications

- Role of biochemistry in natural cycles
  - Carbon cycle
  - Nitrogen cycle
  - Sulfur cycle
  - Phosphorus cycle

- Role of soil biochemistry in environmental quality
  - Soil, air, water