COURSE SYLABUS
ENR 5263 – Biology of Soil Ecosystems

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Office Hours: By email appointment

Exams: Quizzes, Mid-terms; Final

Term Paper: 5 page paper on some aspect of soil microbial ecology

Lecture Topics
A. Soil Ecosystems as Habitat
   • The soil resource – Pedons, horizonation, state factors of soil formation, landscape position
   • Physical properties - Soil structure (particles, aggregates and porosity), air and water
   • Chemical properties - Soil organic matter and C/energy dynamics and other nutrients and pH relative to soil organisms.
B. Soil organisms
   • Microbial community members and functions – soils and aquatic ecosystems
   • Soil faunal community members and functions
   • Methods for studying microbial ecology – activity, mass and diversity
   • Soil biologically driven processes that control ecosystem productivity (redox potential, decomposition and mineralization
   • Biodiversity – does it matter?
   • Interactions and food webs across trophic levels
C. Soil Microbiology and Ecosystem Management
   • Disturbance and environmental impacts on soil biological properties
   • Manipulating microbial communities for beneficial effects - Case studies: Tillage and organic matter inputs; plant growth promoting rhizobacteria; pathogen suppression.; bioremediation
D. Soil Biological Properties as Ecological Indicators
   • Soil Quality: Definition and concept
   • Microbial indicators
   • Soil enzyme activities as integrative soil biological indicators
   • Practical applications