

**NUTRIENT CYCLING METHODS**  
**PLB 546, 2 H CREDIT**  
**2013**  
Syllabus

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Required Text: None. We will follow procedures in Robertson, G. P., C. S. Bledsoe, D. C. Coleman, and P. Sollins. 1999. Standards in soil methods for long term ecological research. Oxford University Press, New York, USA.

Additional readings: Key papers in biogeochemical methods.

Course Objectives: This laboratory is designed to familiarize students with standard methodology and provide hands-on training in analytical techniques used to quantify pools and fluxes of carbon, nitrogen, and phosphorus primarily in soils but also applicable to aquatic systems.

Grading Policy:

Worksheets (5 @ 20 pts each)	100 pts
Comparative Ecosystem Lab Report (Due April 28 <sup>th</sup> )	100 pts
Total	200 pts

*Worksheets.* Students are responsible for all data collected by the entire class. Although it will be necessary to use spreadsheet programs to perform calculations and analyze data, all equations used need to be written out on the worksheet and calculations worked by hand at least one time on the worksheet. Five points will be subtracted for every day a worksheet is turned in late.

*Comparative Ecosystem Lab Report:* Each student must write a lab report on data collected in lab (from worksheets 3, 4, and 5) in format for publication in *Ecosystems*. Instructions for authors can be found on line at: <http://www.springer.com>. Adhering to this guideline is worth 20% of the comparative ecosystem report grade.

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LABORATORY SCHEDULE

DATE	LAB ACTIVITY
Jan 29	Chemistry review, analysis of NADP data ( <a href="http://nadp.sws.uiuc.edu/">http://nadp.sws.uiuc.edu/</a> go to “data access”) <b>Worksheet #1; due Feb 5</b>
Feb 5	Quality control, contamination, quantitative transfer, stock solution and standard preparation calculations; COLLECT WATER SAMPLES & FREEZE
Feb 12	Preparation of stock solutions and standards; basics of spectrophotometry; analysis of NH <sub>4</sub> -N in water samples. <b>Worksheet #2; due Feb 19</b>
Feb 19 or 26	Collection of soil samples for subsequent labs; date is weather dependent.
Mar 5	Process samples for future labs: sieving, water content, bulk density
Mar 19	Conversions for ecological comparisons & preparation for microbial activity: water content; bulk density; total soil porosity; percent water filled pore space Set up: mineralizable and microbial C and N <b>Worksheet #3; due Mar 24</b>
Mar 26	Soil N: available, microbial, potentially mineralizable <b>Worksheet #4; due Apr 7</b>
Apr 7	Denitrification; total C and N by dry combustion <b>Worksheet #5; due Apr 14</b>
Apr 23	Data synthesis; work on lab reports
Apr 30	<b>Comparative ecosystem lab reports due</b>