

BIO / GEO 479L – Environmental Instrumentation Lab – Fall 2007 Syllabus

Assessment of the Wolf Creek Watershed - Montgomery County, Ohio
Service Learning Project with Adventure Central Youth

Course Description

The environmental instrumentation lab is designed as a capstone experience in the use of field and lab equipment and techniques to study current environmental issues with an emphasis on a team-centric approach to investigation. Each student brings to this course their collective knowledge and experiences from all previous courses and research. You will be applying this experience towards an assessment of the Wolf Creek watershed. The Wolf Creek is a tributary of the Great Miami River and is located directly west of the downtown area extending to the west northwest and covering the urban, suburban, and rural areas of West Dayton, Trotwood, Clayton, Englewood, and Brookville. Watershed assessments are quickly becoming a standard practice by federal, state, and local governments to collectively understand the quality and health of the surface waters, the biodiversity, and the relationship between the community land use and the physical watershed. You will be working as a class, with the help of your instructors and community experts, to design and implement an assessment of the Wolf Creek watershed. In addition, a service learning component of the course will involve working with 7-9th grade students at the Adventure Central (AC) after-school education center, which is also a primary site for the assessment. The class will culminate in a presentation to the community on your results.

Course Goals and Expectations

Course Goals

- Investigate a current environmental issue
- Gain proficiency in watershed assessment methods
- Emphasize a team approach to problem solving and investigation
- Understand the connection between the watershed and the surrounding community.
- Work with AC students in building a successful service learning program to raise environmental awareness and benefit the greater Wolf Creek community.

Expectations

During this semester we will expect from all students your best effort and highest quality of work. Additionally we expect:

- Professionalism, leadership, initiative, and collaboration
- Good communication amongst the class and with your instructors
- Students to approach preparation for field and lab work in an independent fashion, including background reading on topics and skills.
- All students to complete work in a timely fashion, preparing in advance for weekly topics and analyzing and synthesizing data following each week.
- Student to commit to a service learning model as part of this course. In this model you will learn by building relationships with the youth at Adventure Central: as teachers, mentors, and colleagues.
- Students will be expected to work with the AC youth as an example of what opportunities they can aspire for: successful college students, professional scientists, and active community partners.

Service Learning and Adventure Central

We will be visiting Adventure Central (AC) many times throughout the semester both on class days and as part of out of class volunteer hours. When we visit AC, you will be working with a core group of middle school students in many different capacities: as teachers, mentors, team members, and role models. As *teachers*, you will show the youth how to measure water quality of the river, teach them about relevant watershed issues and watershed assessment, and help the students find effective ways to communicate their findings at the end of the project. As *mentors*, you will help the AC youth set goals and plan projects and will raise their awareness about science careers and the preparation needed for such career paths. As *team members* and *role models*, you will work collaboratively with the AC youth to collect and analyze water quality data, identify the needs of their watershed, and design and implement service projects to meet these needs. Finally, you will work collaboratively for the final presentation in communicating both the scientific results of the watershed assessment and the service project goals and outcomes.

Through this interaction with the AC youth, you will meet many of the class goals. Very often advanced learning comes through teaching others. Keeping this in mind you will gain proficiency in fundamental watershed assessment methods and will have a deeper understanding of current environmental issues, at the same time you are relating that to the AC youth. Working with the AC youth as team members will also emphasize our goal of using a team approach to solve problems. Lastly, you will develop a better connection between the science of the watershed and its surrounding community by interacting directly with this community of people (AC youth) within the watershed they are studying. This direct interaction will be invaluable as you move on to seek careers in organizations such as the EPA, soil and water conservation, public parks, etc.

Course Information

Instructors

Kelly Bohrer (Biology)

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Katie Schoenenberger (Geology)

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Classroom

Wolf Creek Watershed, Adventure Central, and the Keck Environmental Lab – Science Center 71

Course Materials

There is no textbook for this class. We will be providing readings, handouts, and all other information throughout the semester.

Field Notebook

The bulk of the information for this class will be data collected during field work. You will be given a *field notebook* as part of this class that you will keep for the entire semester and will turn in periodically.

WebCT

WebCT will be the primary source for course materials, files, discussions, and GIS data. If you have any questions about accessing WebCT please talk to Kelly or Katie during the first week of the semester.

Go to: <http://webct.udayton.edu> to log into WebCT with your LDAP username and password.

GIS Software

We will be using ESRI ArcGIS 9.2 software to compile our watershed data and generate finished maps. We will have designated weeks during the semester during which we will introduce this software and how we will use it in our assessment. If you would like to obtain a copy of this software for your personal computer please see Katie during the first few weeks of the semester for a copy and installation instructions

All other lab equipment needed during the semester will be provided and available from the Keck Environmental Lab. You will be receiving instructions and procedures as the semester progresses.

Reading List (to start...)

- 1) EPA Volunteer Stream Monitoring Manual
- 2) EPA Stream Monitoring Techniques Manual
- 3) Tolman, Joel, 2003: Close to Home: Rooting Learning in Community. The Forum for Youth Investment.
- 4) Handouts / WebCT

Field Supplies

EIL is primarily a field based course. Because we will be spending up to 5 hours each class time outside in a field setting, including working in heavily vegetated areas, wadable streams, and various weather conditions (hot, cold, wet, dry, etc...), each student should consider certain personal requirements to ensure a comfortable and enjoyable class experience.

The following is a list of recommended equipment:

- Day pack
- Field Notebook (provided 1st week)
- You will need to wear appropriate shoes for walking on trails (Remember poison ivy) and wading in streams. Knee high rubber boots or waders are a good option. (some boots will be available from the Biology and Geology Departments)
- Long pants are recommended (Again, remember poison ivy)
- For hot weather: hat, sunglasses, sunscreen
- For rain: rain coat, etc. (Don't worry about your field notebook. It is waterproof!)
- For cold weather: Enough layers to keep you warm.
- Snacks/Beverages (Bring a water bottle! We will be out from 1pm until 5:50pm)
- Digital Camera (We will be using digital cameras frequently during field work. We will provide up to 3 cameras for the group to use each week. You may consider using a personal camera if you have access to one. Rain cases will be available to borrow for electronics (camera, gps).

Community Partners / Experts Information (contact information will be linked from WebCT)

- Nate Arnett – AC Center Director
- Kim Catchpole – AC Program Director
- Nina Grout – AC Youth Coordinator
- Ashley Krogel – AC Outreach and Service-Learning Program Assistant
- Ashley Wagner – AC Vista Volunteer
- Joanne Troha – Fitz Center, Director for Community Service Learning
- Caroline McCulloch – Montgomery County Soil and Water Conservation District
- Diane Zimmerman – OhioEPA
- Mike Enright – Five Rivers Metroparks (electrofishing)

Tentative Schedule (See separate expanded schedule)



AC Day



WQ Monitoring Day



Keck Environmental Lab

Month		Location	Topic
August	22	All sites Extended time at AC	Overview and Tour of the Watershed Stop at all of the major features (Headwaters, Brookville, Sycamore S.P., Trotwood, AC, and mouth. <ul style="list-style-type: none"> - Intro to Service Learning and Surveys at Trotwood Park - 3:30 – 4p: Meet up at AC (Introductions and BRIEF tour) - Proceed as group to GMR outlet. Done by 5:30p
	29	Metroparks AC	AC Orientation – Metroparks Office (Fingerprinting) Meet with Caroline McColloch at AC FINALIZE Monitoring Sites. Visit some if needed.
September	5	All sites	Intro to Water Quality - 2 Vans
	12	AC East Sites	Bioassessment – Introduce and collect data on macroinvertebrates. Meet with AC youth <ul style="list-style-type: none"> - 3:30p – 4:30p work with youth on WQ and bioassessment - If time collect at E sites on way back to UD
	19	All Sites	Bioassessment and Introduction to Vegetation (2 Vans)
	26	AC East Sites	East Sites – Finish Vegetation (Could be part of group, some could stay and work at AC). <ul style="list-style-type: none"> - 3:30 – 4:30p Electrofishing with AC Youth
October	3	All sites	Water Quality – 2 Vans Collect for Microbiological Methods Some of the class preps dishes and check outside of class time.
	10	Keck Lab	Keck Lab – Intro to GIS Entry of WQ and Vegetation data. Begin Macroinvertebrate ID <ul style="list-style-type: none"> - Possible UD visit by AC Youth
	17	AC	Meet with Diana (OhioEPA) at AC – EPA & Watersheds / QHEI Introduction Discussion of how things are going so far. <ul style="list-style-type: none"> - 3:30 – 4:30p – Work with AC Youth on Careers in Geosciences/Environment and possibly Macroinvertebrate ID
	24	All Sites	QHEI – 2 Vans
	31	Sycamore AC	Geology of the Watershed / Bedrock and Glacial Glacial Geology stop at AC, include AC students in field work and data collection. <ul style="list-style-type: none"> - 3:30 – 4:30p - Work on Geology project with AC Youth
November	7	All sites	Water Quality – 2 Vans
	14	Keck Lab	Conclusion Discussion – Work on GIS and Data Analysis
	28	Keck Lab	Work on Poster, Presentation, and Report
December	5	Keck Lab	Poster Review and Presentation Practice
	?	AC	Final Presentation at Adventure Central - Date/Time TBA

NOTE: This schedule is subject to change. We most likely will have more stops at AC on days when possible. Even if we just stop in to say hi and have snacks, we want to stay as connected as possible.

Assignments

Weekly Assignments

Each week you will have a short reading, mapping, or data compilation assignment to complete. You will turn these in via WebCT (if possible) in addition to responding to a discussion questions using the WebCT discussion tool. These assignments are designed to keep you on track towards completing any content that will be looked at during your monthly progress report meeting and will help prepare you for the next weeks topics and activities. We will be handing out an extended schedule with assignment information on the first day of class, in addition to being posted on the WebCT calendar.

Progress Reports (Student Meetings)

As a way to check on the progress of individual student work throughout the semester, part of your grade will be determined during a total of three (End of Sept, Oct, Nov) progress meetings with your instructors (BIO-Kelly, GEO-Katie). Each student will be responsible for setting up a time to meet with your respective instructor to go over completed work, collected data, field notebooks, finished maps, and eventually preparation for the final presentation. The meeting will also include an assessment of your comprehension of methods and skills we have covered up until that point. An evaluation sheet discussing the expectations on which we will base the distribution of points will be handed out on the first day of class and will be available on WebCT.

- **Field Notebooks:** Each student will be responsible for keeping a field notebook for the semester. This will be a key tool as you continually collect data for your watershed assessment each week. We will review basic methods in taking good field notes during our first few weeks in the field. We will collect these notebooks at each of your scheduled student meetings and will return them by the next class time following the meeting. We will cover how we will be evaluating your field notes closer to the first set of student meetings.
- **Watershed Plan:** One of the main assignments for this course will be your watershed assessment plan. As with any investigation, the thought and planning that occurs prior and during the project is as important as the acts of data collection and analysis themselves. Your plans will be 2-3 page write-ups that summarize the assessment goals, scope, methods, and possible outcomes. We will provide examples of assessment plans as the semester progresses (check WebCT) in addition to having many discussions throughout the semester on what should be included in the plan. This plan will be evaluated at each of the three progress meetings.

Participation

We will be evaluating your participation grade based on attendance, promptness, the sharing of ideas, skills and knowledge, and on being an active participant during weekly labs. The completion of your 4 visits (8 hours) of service at AC will also be included in this grade.

Service Learning

UD students, working in groups of three, will be required to set up meetings outside of the normal EIL class time (Wed. 1-5:50p) with AC youth (at Adv. Central). Each student will be required to participate in 4 of these service learning meetings. Kelly and Katie will help coordinate the student and AC schedules. During these meetings you will be working with AC students on the development of their own service learning project,

focusing on watershed education and stewardship. This may include UD students teaching AC student about various watershed topics, assisting the AC students with information and data collection, organization, and presentation, or participating in mentoring on careers, higher education, etc..

Final Presentation

The culmination of this course will be a final presentation to the class, instructors, interested UD faculty and staff, and community partners. The presentation will take place at Adventure Central. The goal of the presentation will be to share the results of your assessment with the people that work, live, and are interested in the watershed.

Final Poster

In addition to a final presentation the class will be responsible for completing a poster summarizing the results of the assessment that will part of the annual UD Stander Symposium. Registration for this event will open up in November and we will coordinate this process during one of our scheduled class times in the Keck Lab. All work on the abstract and poster for Stander will be completed by the end of the Fall semester. We will work with the class to coordinate what students will be able to stand at the poster during the symposium.

Final Report

You will also be required to present the results of your assessment (and service learning project) in a report format. There will be overlap with the content of the presentation, poster, and report yet each will serve a distinct purpose in communicating your results to the public. The report will be a brief summary of the goals, scope, methods, results, and conclusions of your project. We will discuss the format and requirement for the report later on in the semester.

Evaluation and Grading

The table below summarizes the distribution of grading for this semester.

	Percentage
Weekly Assignments	20
Progress Reports (Student Meetings)	30
- Field Notebook	10 each
- Watershed Plan	
Final Report	10
Final Presentation	20
Final Poster / Stander	10
Participation	10
- Service Learning	

Final letter grades will be determined according to the following percentages:

A	A-	B+	B	B-	C+	C	C-	D	F
>93%	90	87	83	80	77	73	70	60	< 60

Policies

Attendance

We will be leaving promptly at 1 pm (unless we are scheduled for a lab week) from the rear of the Science Center where the Biology van is parked. If the van is gone you have missed your ride to the field.

We expect attendance to all labs. This course is a cumulative experience and your understanding and effectiveness as part of the team will be hindered by any absence. If you know of any conflicts that will occur with lab this semester please notify your instructors as soon as possible. We will meet with you to discuss alternative work to make up your missed week.

Academic Dishonesty

Please refer to the UD Student Handbook for the full details on the University's academic dishonesty policy. This policy will be followed and enforced. Full details on all of the University's policies can be found in the student handbook: <http://www.udayton.edu/~studev/studenthandbook/>

Keck Environmental Lab and Use of Field Equipment

We will be using a variety of water quality and lab equipment this semester. The use of this equipment is a privilege and as such we expect that all students will use the lab and equipment with care according the use and cleaning procedure provided by your instructors.

If you need to use any equipment that is kept in the back storage room of the lab outside of regular class time, please contact Katie to request and sign-out the equipment BEFORE you plan on using it. All equipment must be signed out from Steve Roberts in the Department of Geology.

During the semester you will have ONE card access to the Keck Lab. The Keck Lab's hours are from 8:30a – 4:30p. For access outside of these times you will need to use your student ID. We will discuss this and the alarm code on the first week of class.

The Keck Lab is also used for other classes during the semester. Please respect other users and share all computers and equipment appropriately. If you feel that you are experiencing trouble accessing lab equipment due to the use by other students please contact your instructors to address any problems.

Note on Computing and the Web Policy

This course will require the use of Microsoft Office. The new Office 2007 suite will save files in a format that is not compatible with Office 2003. Please ensure that if you use Office 2007 that you save files in the 2003 file format ("Compatibility mode"). Failure to comply with these instructions will impact the validity of your homework submissions. Details regarding file compatibility can be found at <http://training.udayton.edu/Office2007>

All users of University of Dayton electronic resources are expected to use online resources fairly, responsibly, and ethically. Illegal actions, including plagiarizing, harassment, disrupting systems, damaging resources, etc are prohibited. Please visit the University of Dayton's policy on Fair, Responsible and Acceptable use of Electronic Resources if you have questions and/or concerns: http://udit.udayton.edu/fraup_policy.pdf