

Course Syllabus

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ENVH 432 Syllabus Winter 2017

Class schedule:

Lecture: Mondays, South Campus Center, SoCC 308, 2:30-3:20pm

Laboratory: Tuesdays and Thursdays, Health Sciences Building, T568-574, 9:30am -12:20pm

Final: Tuesday, March 15, TBA, approx 4:30-6:20pm

Accessing TAs for help: we recommend using the Discussion Board for questions about assignments or concepts from lecture or assigned readings (first thing to try). The TAs will be tracking the board and can add input as needed. You are welcome to ask TAs for help during lab sessions (second thing to try), but if a need arises for more one-on-one help, you can make an appointment with one of the TAs (third thing to try), either in person during class or by email. TA email links are on the course home page.

Class Text (optional):

Quantitative Chemical Analysis, 7th, 8th or 9th edition, by Daniel C. Harris. On reserve in [Health Sciences Library](#) (<http://www.lib.washington.edu/types/course>) and HSB F226.

Fundamentals of Environmental Sampling and Analysis by Chunlong Zhang, Hoboken, N.J.: Wiley-Interscience, 2007, available as [eBook](#) (<http://uwashington.worldcat.org/oclc/71507637?page=frame&url=http%3A%2F%2Foffcampus.lib.washington.edu%2Flogin%3Furl%3Dhttp%3A%2F%2Fwashington.eblib.com%2Fpatron%2FFullRecord.aspx%3Fp%3D287305%26checksum%3D195104af4a6b9595628e80eb>)

Course Description:

This class is the second in a 3 quarter series intended to give students a background and some familiarity with measurement for environmental assessment. The focus of ENVH 432 is detection, sampling, and analysis of chemical hazards in different samples from occupational or environmental settings. This is an introductory course, potentially leading to more specific courses on sampling and analysis of air, water, wastewater, marine samples, soils, and occupational hazards.

Course Learning objectives:

At the end of this course, students should be able to accomplish the following:



1. Identify literature sources of standard methods for environmental and occupational assessment of chemical contaminants, and provide a framework for method selection.
2. Develop and apply a sampling strategy to adequately characterize chemical contaminants in air, water, and solid environmental media.
3. Describe basic concepts in quality control and quality assurance for chemical measurement data.
4. Critically evaluate the reliability of chemical measurement data.
5. Develop analysis plans for measurements of four different chemical contaminants in environmental and occupational samples. Your analysis plans will include selection of appropriate analytical methods and design of appropriate experimental procedures to ensure reliable data
6. Recognize the operating principles, advantages and limitations of several kinds of currently-used semi-quantitative field indicators. Demonstrate proficiency in the use of these devices.
7. Recognize the operating principles, advantages and limitations of several kinds of currently-used field meters for chemical agents. Demonstrate proficiency in the use of these devices.
8. Demonstrate knowledge of the operating principles, advantages and limitations of several kinds of major kinds of laboratory instruments used for chemical analysis, including: FTIR, UV/visible absorption spectrometers, gas chromatographs, atomic absorption spectrometers. Demonstrate proficiency in the operation of these devices.
9. Demonstrate the ability to work effectively and co-operatively as part of a team.
10. Demonstrate competency in technical writing.
11. Describe health hazards associated with at least four important chemical agents found in environmental and occupational settings, and hazards associated with the analytical procedures used to measure those contaminants.

Course organization:

Refer to the Schedule. The course consists of lectures every Monday and lab sessions Tuesday and Thursday. The first lab session is devoted to basic techniques that will be used later in the course: preparation of standards, calibration of equipment. The remainder of the course is comprised of 4 lab modules: air, water, solid media, and airborne particles. Teams of 4 students will carry out each module, which typically have a lab preparation session, a field sampling day, a sample prep session and a lab measurement session.

Class assignments that are turned in for grading include article questions, pre-lab quizzes and the written reports for each lab module or experiment (as specified in each module description). However, this is intended to be a hands-on course and requires preparation in the form of collecting information, planning activities, calculating standard amounts or sampling times, and each student is accountable to their team members to have done the needed preparation prior to class.

Grading:

The final grade will be determined as the weighted mean of the components listed below. The weighted average will be converted to a numeric grade between 0 and 4 using a standard [grading scale](#)  .

1) Pre-labs	10%
2) Lab Reports	40%
3) Journal Article Questions	10%
4) Participation	10%
5) Final Exam	30%

Pre-labs (10%):

Pre-labs are designed to prepare students for conducting the laboratory experiments. Pre-lab quiz questions will be emailed to students by the Friday prior to starting each lab module. Most questions can be answered by reading the lab or lecture materials, or additional resources posted on the lab Module of the course website.

Lab Reports (40%):

Each lab group prepares a report and receives a collective grade for the modules. Specific roles and responsibilities are outlined in the "Round-robin" handout. Each lab report counts as 10% of the total grade. Individual students can improve their lab report grade by submitting draft sections and reviewing their peers' sections prior to the final lab report submission.

Reminder: Students are expected to reference all work and give appropriate attribution for all materials cited, including any reference to websites or articles.

Journal Article Questions & Discussion (10%):

Students are expected to read the assigned article (Articles 1-6) and answer questions prior to each lecture. Questions will be incorporated into lectures and occasional group discussions. The practice (Chlorine) lab in the first week will also fall under this grading category

Participation (10%):

Students are graded individually on class and laboratory session participation. Ways to earn these points include asking questions in class, actively contributing to laboratory sessions and promoting teamwork in lab groups. **Please notify the course instructor or TA, if you will not be able to attend a class.** *Keep in mind that, every time you are late or absent, you place a burden on your team members to fulfill your assigned role.*

Common Courtesy: Part of the quality of your participation is your being responsible for managing your workspace and materials. That means cleaning up after yourself, labeling all materials you will leave in the lab between sessions, and cooperating with classmates in sharing the lab resources including bench space. Untidy, unsafe, or disruptive behavior will be noted as part of your "Participation" performance.

We expect students attending class to give their full attention to class activities; so please, no use of computers or cell phones (including texting) during class, unless needed for data analysis in lab sessions. Thank you!

Final Exam (30%):

Students are graded individually on completion of an in-class final exam. This is a closed-book and closed-note exam. Students must bring a calculator (no cell phones). The exam is composed of matching, multiple choice, story problems with calculations, and essay questions. The essay question does not change from year to year. A practice exam is posted on the course website.

Academic Integrity

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the [University of Washington Student Conduct Code \(WAC 478-120\)](http://www.washington.edu/admin/rules/policies/WAC/478-120TOC.html) (<http://www.washington.edu/admin/rules/policies/WAC/478-120TOC.html>). We expect you to know and follow the university's policies on cheating and plagiarism, and the [SPH Academic Integrity Policy](http://sph.washington.edu/students/academicintegrity/policy.asp) (<http://sph.washington.edu/students/academicintegrity/policy.asp>). Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the [University of Washington Community Standards and Student Conduct website](http://www.washington.edu/cssc/) (<http://www.washington.edu/cssc/>).

Writing Resources: A [self-test for plagiarism](https://www.wcu.edu/learn/academic-success/tutoring-services/services-resources/writing-support/the-plagiarism-self-test/plagiarism-self-test/index.aspx) (<https://www.wcu.edu/learn/academic-success/tutoring-services/services-resources/writing-support/the-plagiarism-self-test/plagiarism-self-test/index.aspx>) is available and additional resources are posted on the course website under Pages/Plagiarism. The UW Bothell Writing Center provides additional resources for English as a second language (ESL) students: <http://www.uwb.edu/wacc/for-students/eslhandbook> (<http://www.uwb.edu/wacc/for-students/eslhandbook>)

Access and Accommodations

Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you experience barriers based on a disability or temporary health condition, please seek a meeting with Disability Resources for Students (DRS) to discuss and address them. If you have already established accommodations with DRS, please communicate your approved accommodations to your instructor at your earliest convenience so we can discuss your needs in this course.

Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (this can include but not limited to: mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu (<mailto:uwdrs@uw.edu>) or <http://depts.washington.edu/uwdrs/>

If you have a disability that is not recognized by DRS, please feel free to discuss it with me if you feel it will impact your performance in the course.

Schedule, Winter 2017 (also see Calendar):

Week	Lecture Topics	Monday 2:30-3:20 pm	Tuesday 9:30am-12:20pm	Thursday 9:30am-12:20pm
1: Jan 2	No Lecture Monday; partial lecture Tuesday	HOLIDAY	Course Overview: Round-Robin Roles & Lab Reports Lab Safety & Chlorine Lab	Survey due by 9:30 AM Complete Chlorine lab, if needed
2: Jan 9	QA/QC	Lecture 1 Article 1 due	Lab 1 Pre-lab 1 due	Lab 1






























3: Jan 16	No class	HOLIDAY	Lab 1	Lab 1
4: Jan 23	Sample Preparation	Lecture 2 Article 2 due Section Draft 1 due	Lab 2 Pre-lab 2 due Review 1 due Wed	Lab 2 Report 1 due Friday
5: Jan 30	Chromatography	Lecture 3 Article 3 due	Lab 2	Lab 2
6: Feb 6	Spectroscopy	Lecture 4 Article 4 due Section Draft 2 due	Lab 3 Pre-lab 3 due Review 2 due Wed	Lab 3 Report 2 due Friday
7: Feb 13	Mass Spectrometry	Lecture 5 Article 5 due Section Draft 3 due	Lab 3	Lab 3
8: Feb 20	No class	HOLIDAY	Lab 4 Pre-lab 4 due Review 3 due Wed	Lab 4 Report 3 due Friday
9: Feb 27	Method Comparison Presentations	Lecture 6 Article 6 due	Lab 4	Lab 4
10: Mar 6	Review for Final	Review Session Section Draft 4 due	No lab class Review 4 due Wed	No lab class Report 4 due Friday


































Group Assignments for Labs 1-4 will be posted on Friday, January 6th.

Experiment A	particles	gravimetry and nephelometry
Experiment B	gases (CO/CO ₂)	tubes, DRIs, FTIR
Experiment C	lead in paint	test kit, XRF, AA
Experiment D	disinfection by-products in water	GC and test-kit

Course Summary:

Date	Details	
Tue Jan 3, 2017	<ul style="list-style-type: none"> 📅 Course Overview and Lab Reports (https://canvas.uw.edu/calendar?event_id=942317&include_contexts=course_1099248) 📅 Chlorine Lab (https://canvas.uw.edu/courses/1099248/assignments/3440601) 	9:30am to 12:20pm due by 12:30pm
Thu Jan 5, 2017	<ul style="list-style-type: none"> 📅 No Lab Class (https://canvas.uw.edu/calendar?event_id=942322&include_contexts=course_1099248) 	9:30am to 12:20pm
Mon Jan 9, 2017	<ul style="list-style-type: none"> 📅 Article 1: QA/QC Questions; open book, 1 hour time limit (https://canvas.uw.edu/courses/1099248/assignments/3440599) 📅 QA/QC (https://canvas.uw.edu/calendar?event_id=942329&include_contexts=course_1099248) 	due by 2pm 2:30pm to 3:20pm
Tue Jan 10, 2017	<ul style="list-style-type: none"> 📅 Lab 1 (https://canvas.uw.edu/calendar?event_id=942327&include_contexts=course_1099248) 	9:30am to 12:20pm
Thu Jan 12, 2017	<ul style="list-style-type: none"> 📅 Lab 1 (https://canvas.uw.edu/calendar?event_id=942319&include_contexts=course_1099248) 	9:30am to 12:20pm
Mon Jan 16, 2017	<ul style="list-style-type: none"> 📅 HOLIDAY, No Class (https://canvas.uw.edu/calendar?event_id=942334&include_contexts=course_1099248) 	12am
Tue Jan 17, 2017	<ul style="list-style-type: none"> 📅 Lab 1 (https://canvas.uw.edu/calendar?event_id=942320&include_contexts=course_1099248) 	9:30am to 12:20pm
Thu Jan 19, 2017	<ul style="list-style-type: none"> 📅 Lab 1 (https://canvas.uw.edu/calendar?event_id=942328&include_contexts=course_1099248) 📅 Article 2: Sample Prep Questions (https://canvas.uw.edu/courses/1099248/assignments/3440597) 📅 Sample Preparation (https://canvas.uw.edu/calendar?event_id=942335&include_contexts=course_1099248) 	due by 2pm 2:30pm to 3:20pm

Mon Jan 23, 2017	<p> Section Draft: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440620) (5 students)</p> <p> Section Draft: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440622) (5 students)</p> <p> Section Draft: Water (https://canvas.uw.edu/courses/1099248/assignments/3440623) (4 students)</p>	<p>due by 6pm</p> <p>due by 6pm</p> <p>due by 11:59pm</p>
Tue Jan 24, 2017	<p> Lab 2 (https://canvas.uw.edu/calendar?event_id=942315&include_contexts=course_1099248)</p> <p> Review: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440616) (5 students)</p>	<p>9:30am to 12:20pm</p> <p>due by 11:59pm</p>
Wed Jan 25, 2017	<p> Review: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440618) (5 students)</p> <p> Review: Water (https://canvas.uw.edu/courses/1099248/assignments/3440619) (4 students)</p>	<p>due by 11:59pm</p> <p>due by 11:59pm</p>
Thu Jan 26, 2017	<p> Lab 2 (https://canvas.uw.edu/calendar?event_id=942326&include_contexts=course_1099248)</p> <p> First unit final lab report - weeks 2,3 (https://canvas.uw.edu/courses/1099248/assignments/3564016)</p> <p> Lab Report A: Particles (5) (https://canvas.uw.edu/courses/1099248/assignments/3440604) (Red)</p>	<p>9:30am to 12:20pm</p> <p>due by 10pm</p> <p>due by 10pm</p>
Fri Jan 27, 2017	<p> Lab Report B: Gases (5) (https://canvas.uw.edu/courses/1099248/assignments/3440606) (Green)</p> <p> Lab Report D: Water (5) (https://canvas.uw.edu/courses/1099248/assignments/3440610) (Blue)</p>	<p>due by 10pm</p> <p>due by 10pm</p>
Mon Jan 30, 2017	<p> Article 3: SPE & Chromatography Questions (https://canvas.uw.edu/courses/1099248/assignments/3440596)</p> <p> Chromatography (https://canvas.uw.edu/calendar?event_id=942336&include_contexts=course_1099248)</p>	<p>due by 2pm</p> <p>2:30pm to 3:20pm</p>
Tue Jan 31, 2017	<p> Lab 2 (https://canvas.uw.edu/calendar?event_id=942310&include_contexts=course_1099248)</p>	<p>9:30am to 12:20pm</p>
Thu Feb 2, 2017	<p> Lab 2 (https://canvas.uw.edu/calendar?event_id=942311&include_contexts=course_1099248)</p> <p> Article 4: Spectroscopy Questions (https://canvas.uw.edu/courses/1099248/assignments/3440595)</p> <p> Spectroscopy - Graeme Carvlin, guest lecture (https://canvas.uw.edu/calendar?event_id=942323&include_contexts=course_1099248)</p>	<p>9:30am to 12:20pm</p> <p>due by 2pm</p> <p>2:30pm to 3:20pm</p>
Mon Feb 6, 2017	<p> Section Draft: Water (https://canvas.uw.edu/courses/1099248/assignments/3440623) (5 students)</p> <p> Section Draft: Lead (https://canvas.uw.edu/courses/1099248/assignments/3440621) (5 students)</p> <p> Section Draft: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440622) (4 students)</p>	<p>due by 6pm</p> <p>due by 11:59pm</p> <p>due by 11:59pm</p>
Tue Feb 7, 2017	<p> Lab 3 (https://canvas.uw.edu/calendar?event_id=942312&include_contexts=course_1099248)</p> <p> Review: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440618) (4 students)</p>	<p>9:30am to 12:20pm</p> <p>due by 11:59pm</p>
Wed Feb 8, 2017	<p> Review: Water (https://canvas.uw.edu/courses/1099248/assignments/3440619) (5 students)</p>	<p>due by 11:59pm</p>
Thu Feb 9, 2017	<p> Lab 3 (https://canvas.uw.edu/calendar?event_id=942313&include_contexts=course_1099248)</p> <p> Lab Report A: Particles (5) (https://canvas.uw.edu/courses/1099248/assignments/3440604) (Blue)</p> <p> Lab Report C: Lead (5) (https://canvas.uw.edu/courses/1099248/assignments/3440608) (Red)</p>	<p>9:30am to 12:20pm</p> <p>due by 10pm</p> <p>due by 10pm</p>
Fri Feb 10, 2017	<p> Lab Report D: Water (5) (https://canvas.uw.edu/courses/1099248/assignments/3440610) (Green)</p> <p> Second unit final lab report - weeks 4, 5 (https://canvas.uw.edu/courses/1099248/assignments/3564017)</p>	<p>due by 10pm</p> <p>due by 10pm</p>
Mon Feb 13, 2017	<p> Article 5: Mass Spectrometry Questions (https://canvas.uw.edu/courses/1099248/assignments/3440598)</p> <p> Mass Spectrometry - Chris Gill, Guest Lecture (https://canvas.uw.edu/calendar?event_id=942330&include_contexts=course_1099248)</p>	<p>due by 2pm</p> <p>2:30pm to 3:20pm</p>
Tue Feb 14, 2017	<p> Lab 3 (https://canvas.uw.edu/calendar?event_id=942314&include_contexts=course_1099248)</p>	<p>9:30am to 12:20pm</p>
Thu Feb 16, 2017	<p> Lab 3 (https://canvas.uw.edu/calendar?event_id=942333&include_contexts=course_1099248)</p>	<p>9:30am to 12:20pm</p>

	 HOLIDAY, No Class (https://canvas.uw.edu/calendar?event_id=942316&include_contexts=course_1099248)	12am
Mon Feb 20, 2017	 Section Draft: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440620) (5 students)	due by 6pm
	 Section Draft: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440622) (5 students)	due by 6pm
	 Section Draft: Lead (https://canvas.uw.edu/courses/1099248/assignments/3440621) (4 students)	due by 11:59pm
Tue Feb 21, 2017	 Lab 4 (https://canvas.uw.edu/calendar?event_id=942331&include_contexts=course_1099248)	9:30am to 12:20pm
Wed Feb 22, 2017	 Review: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440616) (5 students)	due by 11:59pm
	 Review: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440618) (5 students)	due by 11:59pm
Thu Feb 23, 2017	 Lab 4 (https://canvas.uw.edu/calendar?event_id=942324&include_contexts=course_1099248)	9:30am to 12:20pm
Fri Feb 24, 2017	 Lab Report A: Particles (5) (https://canvas.uw.edu/courses/1099248/assignments/3440604) (Green)	due by 10pm
	 Lab Report B: Gases (5) (https://canvas.uw.edu/courses/1099248/assignments/3440606) (Red)	due by 10pm
	 Lab Report C: Lead (5) (https://canvas.uw.edu/courses/1099248/assignments/3440608) (Blue)	due by 10pm
	 Third unit final lab report - weeks 6,7 (https://canvas.uw.edu/courses/1099248/assignments/3564025)	due by 10pm
Mon Feb 27, 2017	 Article 6: Method Comparison and Presentation (GROUP ASSIGNMENT) (https://canvas.uw.edu/courses/1099248/assignments/3440600)	due by 9:30am
	 Article Discussion (https://canvas.uw.edu/calendar?event_id=942321&include_contexts=course_1099248)	2:30pm to 3:20pm
Tue Feb 28, 2017	 Lab 4 (https://canvas.uw.edu/calendar?event_id=942325&include_contexts=course_1099248)	9:30am to 12:20pm
Thu Mar 2, 2017	 Lab 4 (https://canvas.uw.edu/calendar?event_id=942332&include_contexts=course_1099248)	9:30am to 12:20pm
Mon Mar 6, 2017	 Review for Final Exam (https://canvas.uw.edu/calendar?event_id=942318&include_contexts=course_1099248)	2:30pm to 3:20pm
	 Section Draft: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440620) (4 students)	due by 6pm
	 Section Draft: Water (https://canvas.uw.edu/courses/1099248/assignments/3440623) (5 students)	due by 6pm
	 Section Draft: Lead (https://canvas.uw.edu/courses/1099248/assignments/3440621) (5 students)	due by 11:59pm
Wed Mar 8, 2017	 Review: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440616) (4 students)	due by 11:59pm
	 Review: Water (https://canvas.uw.edu/courses/1099248/assignments/3440619) (5 students)	due by 11:59pm
Fri Mar 10, 2017	 Fourth unit final lab report - weeks 8,9 (https://canvas.uw.edu/courses/1099248/assignments/3564026)	due by 10pm
	 Lab Report B: Gases (5) (https://canvas.uw.edu/courses/1099248/assignments/3440606) (Blue)	due by 10pm
	 Lab Report C: Lead (5) (https://canvas.uw.edu/courses/1099248/assignments/3440608) (Green)	due by 10pm
	 Lab Report D: Water (5) (https://canvas.uw.edu/courses/1099248/assignments/3440610) (Red)	due by 10pm
Tue Mar 14, 2017	 Final Exam (https://canvas.uw.edu/courses/1099248/assignments/3440602)	due by 4:30pm
	 Individual Participation in Lab Modules (https://canvas.uw.edu/courses/1099248/assignments/3440603)	
	 Lab Report A: Particles (6) (https://canvas.uw.edu/courses/1099248/assignments/3440605)	
	 Lab Report B: Gases (6) (https://canvas.uw.edu/courses/1099248/assignments/3440607)	
	 Lab Report C: Lead (6) (https://canvas.uw.edu/courses/1099248/assignments/3440609)	
	 Lab Report D: Water (6) (https://canvas.uw.edu/courses/1099248/assignments/3440611)	
	 Pre-lab A: Particles (https://canvas.uw.edu/courses/1099248/assignments/3440612)	
	 Pre-lab B: Gases (https://canvas.uw.edu/courses/1099248/assignments/3440613)	
	 Pre-lab C: Lead (https://canvas.uw.edu/courses/1099248/assignments/3440614)	

❏ [Pre-lab D: Water \(https://canvas.uw.edu/courses/1099248/assignments/3440615\)](https://canvas.uw.edu/courses/1099248/assignments/3440615)

❏ [Review: Lead \(https://canvas.uw.edu/courses/1099248/assignments/3440617\)](https://canvas.uw.edu/courses/1099248/assignments/3440617)
