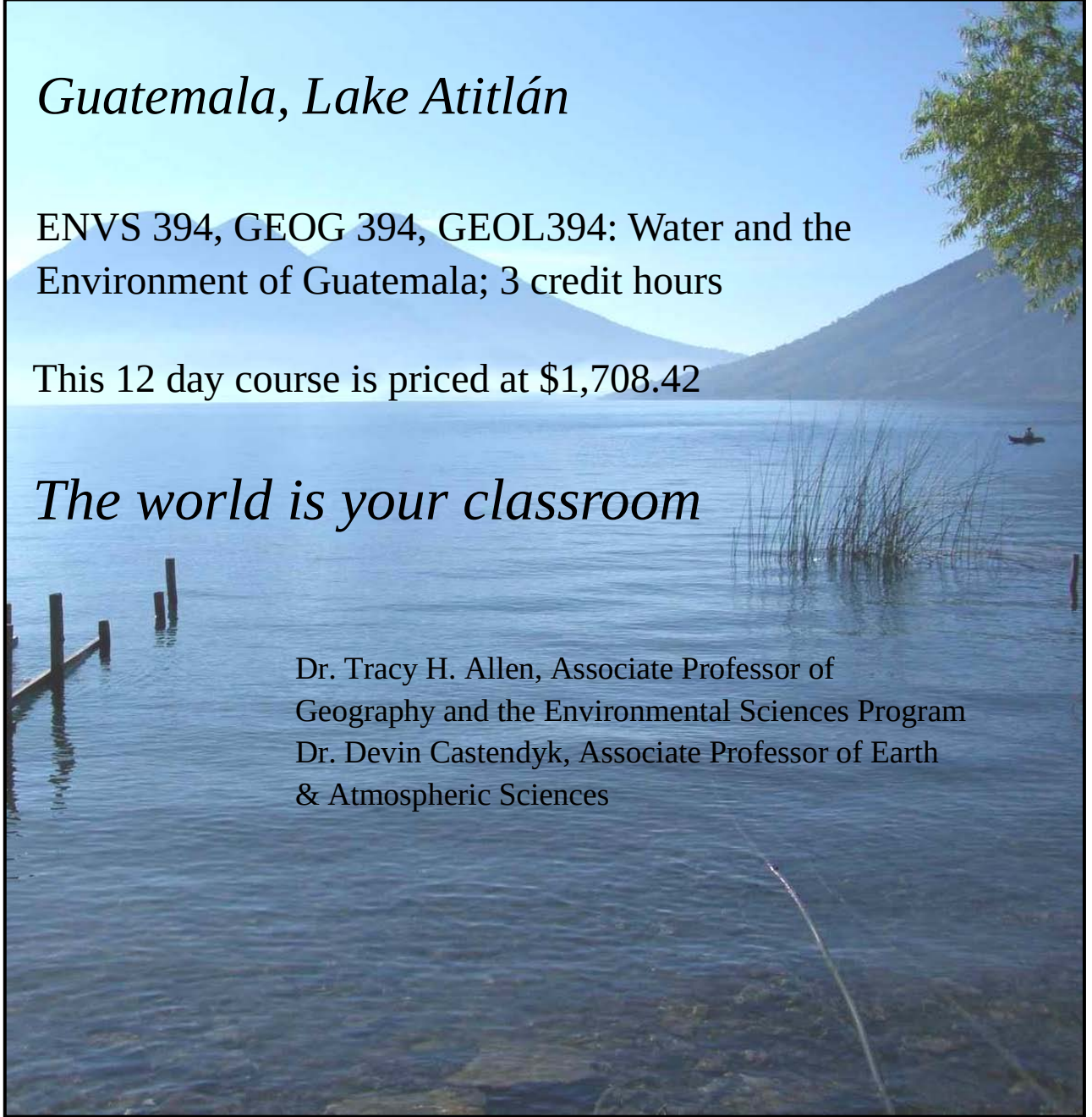




Guatemala, Lake Atitlán

ENVS 394, GEOG 394, GEOL394: Water and the Environment of Guatemala; 3 credit hours

This 12 day course is priced at \$1,708.42

The world is your classroom

Dr. Tracy H. Allen, Associate Professor of
Geography and the Environmental Sciences Program
Dr. Devin Castendyk, Associate Professor of Earth
& Atmospheric Sciences

The Department of Geography, Earth and Atmospheric Sciences, and the Environmental Sciences Program at SUNY, College at Oneonta are sponsoring a Water and the Environment field course to Lake Atitlán, and greater Guatemala, May 27 to June 7, 2014

Investigate why lake Atitlán is becoming polluted and what can be done to save it. You will measure water quality, sample local streams, survey the watershed, visit a finca (coffee plantation), build a learning community with local elementary school children, explore Mayan ruins, discover Antigua (a UNESCO World Heritage Site), and climb an active volcano!

FACULTY-LED STUDY ABROAD PROGRAM TO GUATEMALA

Course Overview

ENVS 394, GEOG 394, GEOL 394: Water and the Environment of Guatemala

This is a faculty-led study abroad course to Guatemala that will be taught over 12 days, May 27 to June 7, 2014, during Summer Session One. The Course will be taught by Dr. Tracy H. Allen, Associate Professor of Geography and the Environmental Sciences Program and Dr. Devin Castendyk, Associate Professor of Earth & Atmospheric Sciences. The course will be cross-listed with GEOG 394 and GEOL 394.

Course justification

Water is the most distinctive and abundant substance found on Earth; yet, it is often scarce or unusable by location. Increasingly, human activities are creating shortages of this most essential resource as it is overused, misused, and polluted. The purpose of this course is to create a hands-on learning experience that prepares students to find solutions to contemporary water resources problems and environmental issues in Guatemala. Most of the course will focus on the water resources of Lake Atitlán and its watershed. Students will take water samples and analyze water quality data from Lake Atitlán and the surrounding drainage basin. Based on observations, interactions with local residents, and data collection, students will explore sustainable water resources solutions. As water quality in the watershed and lake increasingly become impaired, the very way of life for the traditional, largely Mayan, population is at risk. There is a critical need for scientific research in the Lake Atitlán region. Throughout the study abroad experience, students will also be exposed to Guatemala's natural systems, from landforms and climate to soils and biomes. The course will explore how humans interact with and impact Guatemala's natural environment, and examine our role as "responsible stewards." While students will actively engage in undergraduate research, using cutting-edge technologies to empirically answer environmental issues, they will do so while experiencing a way of life and worldviews different from their own. By emphasizing *Student Engagement*, *Global Connectedness*, and *Sustainability*, three of the seven pillars of SUNY Oneonta's educational experience, students will emerge from this course as global citizens prepared to address complex environmental issues.

Course itinerary and list of topics to be covered

Pre-departure Class 1, May 2014: Overview of the physical geography, geology, and ecology of Guatemala.

Pre-departure Class 2, May 2014: Overview of various water quality parameters.

Proposed On-location Itinerary

Day 1 Tuesday, May 27:

- Course begins at NYC airport; depart NYC; students must get themselves to the airport
- Arrive Guatemala City airport; shuttle to Lake Atitlan; tour local area
- On the shore of Lake Atitlán - discuss the formation of the landscape features that are immediately visible; investigate plate tectonics, geologic history of the Lake, eruptive history of Lake Atitlán caldera and volcanoes and, contemporary geologic hazards in Guatemala (i.e., earthquakes, volcanoes, and landslides)

Day 2 Wednesday, May 28:

- Visit local museum; learn about the area's geography, geology, and Mayan culture
- Meet the local mayor and regional water regulator
- Tour waste water treatment plant
- Compare and contrast waste water treatment in Guatemala and the U.S.
- Lecture on the Mayan population who live around and rely on Lake Atitlán
- Briefly outline the geopolitical turmoil that the local Mayans have experienced

Day 3 Thursday, May 29:

- 8 students Trek into the Quiscab watershed; take samples
- 8 students Trek into the San Francisco watershed; take samples
- Conduct initial water testing at Casa de Amigos
- Discuss landuse and land cover of the watershed and streams as a continuum
- Discuss the water quality of the watershed based on samples taken while in the field (specific emphasis on nitrates, phosphates, pH, Conductivity, and turbidity)

Day 4 Friday, May 30:

- Switch watershed: 8 students Trek into the Quiscab watershed; take samples
- 8 students Trek into the San Francisco watershed; take samples
- Conduct initial water testing at Casa de Amigos
- Discuss landuse and land cover of the watershed and streams as a continuum
- Discuss the water quality of the watershed based on samples taken while in the field (specific emphasis on nitrates, phosphates, pH, Conductivity, and turbidity)

Day 5 Saturday, May 31:

- Public launch to San Pedro; Tuk Tuks to the organic, cooperative, coffee plantation, La Voz; Fina tour
- Free time in San Pedro
- Discuss sustainable agriculture in less developed countries; focus on sustainable coffee production; what are the limitations of sustainable agriculture in Guatemala?

Day 6 Sunday, June 1:

- Meet boat at dock with all gear; travel to site Weiss G on the lake; Sample lake at 10 m intervals from the surface to the lake bottom
- Swim in the lake from the boat (optional)
- Water quality analysis at La Casa de Amigos
- Discuss the water quality of the watershed based on samples taken while in the field (specific emphasis on dissolved oxygen, nitrates, phosphates, pH, Conductivity, and turbidity)

Day 7 Monday, June 2:

- Half of group helps with water quality analyses
- Half of group prepares student secchi disk presentations for Niños - switch roles
- Free time; go explore
- Work on water quality presentation for school children

Day 8 Tuesday, June 3:

- Give presentation to upper level elementary students (5th graders) in the morning
- Take students on quick boat ride to use secchi disk (depends on boat availability); otherwise, demonstrate secchi disk off the dock
- Spend afternoon preparing for presentations on lake management and solutions
- Group presentations on lake management and solutions

Day 9 Wednesday, June 4:

- Tour Mayan ruins at Iximche; visit museum, tour site
- Learn about environmental degradation and the collapse of the Mayan Empire
- Transport to Antigua; free time

Day 10 Thursday, June 5:

- All day exploration of Pacaya (an active volcano); see flowing lava
- Discuss Guatemalan biomes; highland biogeography & human activities; vertical climate zones as we walk

Day 11 Friday, June 6:

- Walking tour of Antigua (a UNESCO World Heritage Site)
- Explore Antigua on your own; go to a museum; shop; free time
- Group dinner and course summary

Day 12 Saturday, June 7:

- Shuttle from the Black Cat to Guatemala Airport
- Students check through airport security; course ends
- Save some money: there is an additional airport security fee (currently 20 quetzals, or approximately \$2.60) that all travelers must pay at the airport

Suggested readings

Barrientos, Cèsar and Fernandez, Victor (1998) *Water, Population, and Sanitation in the Mayan Biosphere Reserve of Guatemala* in Water and Population Dynamics: Case Studies and Policy Implications. Sherbinin, Alex and Dompka, Victoria, eds. Montreal, Canada: International Union for Conservation of Nature.

Cech, Thomas (2010) Principles of Water Resources: History, Development, Management, and Policy, 3rd Edition. Hoboken, New Jersey: John Wiley and Sons, Inc. ISBN-978-0-470-13631-7.

Dingman, Lawrence (2008). Physical Hydrology, 2nd Ed., Waveland Press Inc., ISBN-10: 1577665619

Jones, J (2010) Water Sustainability: A Global Perspective. London, UK: Hodder Education. ISBN- 978-1-444-10488-2.

Scholz, Roland (2011). Environmental Literacy in Science and Society, Cambridge University Press, ISBN: 978-01-521-18333-8.

Additional facilities needed to support the course

The organization Appropriate Technologies Collaborative (ATC: <http://apptechdesign.org/>) will coordinate field transportation, meals, and lodging. ATC has operated in Guatemala for over a decade, and has coordinated similar student-based programs at Lake Atitlán for Michigan State University, the University of Michigan, and Rutgers University. John Barrie, Executive Director of ATC (<http://www.johnbarrie.com/>) was the 2011 Cornell-Gladstone-Hanlon-Kaufmann Lecturer at SUNY Oneonta.

Course Syllabus



Water & Environment of *Guatemala*

**Geography 394, Environmental
Sciences 394, or Geology 394,
Summer Session I, 2013**

Lake Atitlan, Guatemala

Instructors: Dr. Tracy H. Allen, Chair, Department of Geography, Associate Professor of Geography and the Environmental Sciences Program
Dr. Devin Castendyk, Director of the Water Resources Program, Associate Professor of Earth & Atmospheric Sciences

Office: 317B Milne Library, Associate Professor of Geography and the Environmental Sciences Program

Office Hours: Talk to me about your assignments throughout the course. If you need to see me, I will be available.

Phone: Office - 436-3152; Department of Geography: 436-3459

E-mail: allenth@oneonta.edu

Course Website: <http://employees.oneonta.edu/allenth/>

Course Description: Geography 394, Environmental Sciences 394, and Geology 394 are cross-listed. The course is worth 3 credits. The purpose of this course is to create a hands-on learning experience that prepares students to find solutions to contemporary water resources problems and environmental issues in Guatemala. Most of the course will focus on the water resources of Lake Atitlán and its watershed. Students will take water samples and analyze water quality data from Lake Atitlán and the surrounding drainage basin. Based on observations, interactions with local residents, and data collection, students will explore sustainable water resources solutions. As water quality in the watershed and lake increasingly become impaired, the very way of life for the traditional, largely Mayan, population is at risk. Throughout the study abroad experience, students will also be exposed to Guatemala's natural systems, from landforms and climate to soils and biomes. The course will explore how humans interact with and impact Guatemala's natural environment, and examine our role as "responsible stewards." While students will actively engage in undergraduate research, using cutting-edge technologies to empirically answer environmental issues, they will do so while experiencing a way of life and worldviews different from their own. This is an experiential course and active participation is required for successful completion. Permission of the instructor is required.

Learning Outcomes: By the end of this course, students will be able to:

- a) Describe the major natural processes that determine Guatemala's landscapes, climates, soils, and biomes.
- b) Measure the mass loading of surface water pollution within Lake Atitlán's watershed, associate specific pollutants with specific land uses and waste disposal practices, and propose watershed management solutions appropriate for a developing nation that will improve surface water quality over time.
- c) Measure and analyze the water quality of Lake Atitlán, link pollutants to eutrophication, predict the future health of the lake system, and propose lake management solutions appropriate for a developing nation.
- d) Understand that access to safe drinking water is a widespread problem throughout most of Guatemala and formulate appropriate goals for drinking water purification and waste water treatment that would be viable in a developing nation with limited financial resources.
- e) Communicate with indigenous peoples in Guatemalan in order to learn their concerns and priorities for local water resources, and empower these communities to independently manage their water resources in fulfillment of their priorities without imposing the methods, values, or standards used in developed nations.
- f) Recognize the myriad environmental problems facing Guatemala, such as deforestation, resource extraction, population increase, and soil erosion; and, establish that economic growth and necessity often take precedent over the environment in developing countries.
- g) Formulate goals toward achieving sustainable agriculture in Guatemala, while recognizing the importance of corn, bananas, and coffee as food and cash crops.

Grading Criteria:

Work Completed	Possible Points	Grading Scale
Learning Outcomes Summary	10	93-100% = A 90-92% = A- 87-89% = B+ 83-86% = B 80-82% = B- 77-79% = C+
Water Quality Solutions Summary and Presentation	10	
Course Participation	20	
Field Notebook	20	
Lab Assignments (Each lab is worth 10 points)	40	
Lab One: Water Quality and Land Use		73-76% = C
Lab Two: Water Quality Change Analysis		70-72% = C-
Lab Three: Service Learning -Teaching School Children About Water Resources and Lake Management		60-69% = D
Lab Four: Climate, Biomes, Attitudinal Zones, and Change		Below 60% = F

Learning Outcomes Summary - 10% of Total Grade. Students will write a two-page summary on what they learned in this course.

Water Quality Solutions Summary and Presentation - 10% of Total Grade. Based on observations, interactions with local residents, and data collection, students will find sustainable solutions to water resources problems in the Lake Atitlán basin. Students will write a summary of solutions. Working in pairs, students will give a presentation to the class on solutions.

Course Participation – 20% of Total Grade. Students will actively participate in their education. Traveling abroad is a major learning experience in itself, but asking questions, discussing field topics, learning by doing and touching, and genuinely being involved and enthusiastic about learning is important to your overall grade. In other words do not be a lump. Appreciate that you are in a different culture and locationally unique environment. You must participate in every scheduled course activity. For every class activity missed, one letter grade will be deducted from your overall course grade.

Lecture and Field Notebook - 20% of Total Grade. You will take notes on lectures and field experiences. The notebook should be in chronological order with lecture and field notes clearly labeled. Write down all lecture points and terminology. Take basic notes on field experiences - where did we go and why? You should walk around with your notebook in hand. Complete at least one field entry for each day the course meets that intellectually address a lecture discussion topic or other scholarly observation or reflection. This scholarly observation does not have to be long. One well written paragraph will do. If you wish to keep a separate journal for yourself of personal information, by all means do so. However, do not turn-in field experience topics such as “today I went swimming” and “today I had fun purchasing a new belt”. Keep your work scholarly. Your notebook will be graded based upon, lecture notes, field notes, daily intellectual discussion of a field topic. Both quality and quantity are important measures of a successful notebook. I suggest a hardbound notebook so that you can take notes in the field. **Other** people in the class can’t take notes for you. You have to write your own notes.

Lab Assignments - 40% of Total Grade. You will be graded based on how well you complete four hands-on lab assignments. The assignments will be conducted in the field and lab.

Policies and Course Rules:

- 1. Class Behavior.** We expect general rules of etiquette and respectful behavior to be followed. No rude, disorderly, or disruptive behavior while participating in any class supported activities. This includes: actual class lecture, visiting local course sponsored attractions, and riding on the bus. Be respectful of your professors and the culture you are visiting. Be respectful of your peers and avoid argumentation or risk the potential of being sent home.
- 2. Academic Dishonesty.** Always uphold a high standard of academic integrity and honesty. Academic dishonesty is defined by SUNY College at Oneonta "as any act by a student that misrepresents or attempts to misrepresent to an instructor or any College official, the proficiency or achievement of that student or another student in any academic exercise for the purpose of influencing a grade on a piece of assigned work, on an

examination or quiz or in a Course as a whole, or that is intended to alter any record of a student's academic performance by unauthorized means." According to College policy, "a student deemed guilty of an act of academic dishonesty may, depending on the nature of the offense, be subject to one or more of the following measures: failure of the assignment or examination, failure of the course, or dismissal from the College. In all cases of intentional plagiarism or cheating on an exam or exercise, you will be permanently dismissed from the course and assigned a failing grade.

3. ***Drinking and Smoking.*** No drinking alcohol or smoking on the bus or public places! Drinking on the bus is illegal and disruptive. Drinking during academic activities is NOT permissible. Do not drink and be disruptive or you will be sent home.
4. ***Attendance and Tardiness.*** Regular attendance to all class sponsored events is expected and necessary. Failing to attend class activities will result in failing the course. Always arrive on time. Late arrivals disrupt class. If you are tardy without a legitimate reason, cleared ahead of time by your professors, points will be deducted from your course grade. For example, after five minutes of leeway beyond the scheduled meeting time, one point per minute will be deducted from your participation score. By holding the group up, you are forcing other students to adhere to your schedule and miss activities planned for the day. **Do not be late!!**
5. ***Missing a Field Class.*** In the event that you miss a day of class due to sickness, you will write a 4-5 page report on the topic of the day. If you miss a day for any reason other than sickness 10 points will be deducted from your final grade (one letter grade). If you decide not to write the report, 10 points will be deducted from your final course grade.
6. ***Safety.*** If you decide to go out at night when the class is not meeting, it is always a good idea to bring a friend along. Avoid leaving the group at night and heading out on your own. If you decide to leave the hotel/hostel where the class is staying, you must return to the same hotel/hostel to sleep. Do not stay in a different place. Your instructors will have no means by which to track you down should you be late for class the following morning. Failure to follow this rule will result in failing the course. You will be immediately sent home and will be responsible for all charges associated with an early departure.
7. ***Respect.*** Always be culturally respectable. You are a guest in another culture.

Student Travel Costs:

GUATEMALA	
Meals	\$212.00
Lodging	165.50
Air Fare	690.00
Excursions/cultural activities/local ground transportation	150.00
Agent fee	53.12
Water analysis	62.50
Local guide	101.00
Subtotal:	1434.12
5% OAS fee:	71.71
International Health Insurance (optional with proof of comparable domestic insurance)	20.00
Program fee (to include faculty travel costs):	182.59
Total cost:	1708.42
Other expenses:	
Passport:	150.00
Spending money:	150.00

Payment Schedule

1st payment due: January 2, 2014	\$125.00(non-refundable)
2nd payment due: February 3 , 2014	\$800.00(non-refundable)
Balance due: March 14, 2014	\$783.00 (non-refundable)
Tuition for 3 credits due May 1, 2014	refundable up to May 26, 2014