**CEE 4350: Environmental Technology in the Developing World**

**1. Course overview.** The course seeks to develop practical skills to evaluate environmental technologies in developing countries. The global burden of disease is known to be dominated by a variety of environmental risk factors that include poor air quality (both indoors and outdoors), water borne diseases, and issues related to sanitation; potential solutions involve the application of promising technologies. This class will involve an interdisciplinary approach to the evaluation of and application of technologies, with emphasis on problem-based, hands-on learning. Students will become familiar with key health and environmental problems specific to developing regions; measurement techniques; social, cultural, and economic constraints that apply to design; and the planning and execution of a field project with local colleagues. The course will culminate in a final report and presentation.

**2. Learning outcomes**

1. Cultivate an appreciation for the roles of environmental technologies in improving global environmental health  
2. Develop an understanding of key linkages between environmental quality and health  
3. Increase understanding of design considerations relevant to the development of appropriate technology in low-income settings  
4. Gain practical field experience in applied air and water research

5. Development of key leadership competencies: collaboration, cultural awareness, and leadership in the context of new technologies

**3. Course structure**. The students will be broken into two groups with each group initially tasked with defining important environmental problems in the specific country of interest. Each group will have a Graduate Student Leader that will serve as an adviser and keep the groups on track. The groups will have initial areas that will be their focus (i.e. indoor air quality, outdoor air quality, drinking water quality, surface water quality, sanitation etc.) and within those areas will determine the key problems that can be quantified as part of the field project. Students will work with counterparts based in the country of interest to refine problem definitions, approaches, and to give feedback on potential solutions. Specific tasks will be:

1. Define the environmental problem of interest
2. Develop methodologies to evaluate the extent of the problem
3. Conduct test-run field experiments in Atlanta
4. Conduct field experiments in country
5. Analyze data, prepare report and presentation including mitigation suggestions

**4. Instructor**. Joe Brown PhD PE

Room 3226, ES&T Building

Email:[joe.brown@ce.gatech.edu](mailto:joe.brown@ce.gatech.edu)

**5. Prerequisites.** None.

**6. Evaluation.** Grades will be computed as follows:

|  |  |
| --- | --- |
| **Grading opportunity** | **% of final grade** |
| Active participation and attendance | 20% |
| Group participation grade (peer & TA) | 20% |
| Methods report (group and individual grade) | 20% |
| Final presentation (group grade) | 20% |
| Final report (group and individual grade) | 20% |

**7. Academic integrity.** Students in this class are expected to abide by the Georgia Tech Honor Code (http://www.honor.gatech.edu/) and to avoid any instances of academic misconduct, including but not limited to: (1) use of cell phones during class; (2) possessing, using, or exchanging improperly acquired written or oral information in the preparation of homework, class project, and exams (cheating); (3) use of material that is wholly or substantially identical to that created or written by another individual or group; or (4) false claims of performance or work.

**8. Attendance**. If you miss class, you are responsible for obtaining all notes, announcements, and assignments. Lecture is a time when we all work together, so be courteous to your fellow students and do not disrupt class by entering and leaving the room during class, reading, talking, allowing cell phones to ring, etc. If you know that you must leave class early, sit in the back and leave quietly. Unexcused absences will affect your participation grade. Failure to meet with your group and contribute to group project work will result in poor peer evaluations.

**9. Learning accommodations**. If needed, we will make classroom accommodations for students with disabilities. These accommodations must be arranged in advance and in accordance with the ADAPTS office (http://www.adapts.gatech.edu).

**10. Leadership.** The course also explicitly incorporates a focus on leadership, including specific training to foster collaboration, cultural awareness, and leadership in the context of new technologies. These competencies will be developed via appropriate group work and collaborative projects, team-building exercises (personality assessments, development of team charters, regular feedback and team evaluations), overseas field work with cultural immersion, active reflection on cultural differences influencing work output, and discussion on leadership and decision-making in the context of developing countries where different conditions and constraints apply.

**11. Preliminary Class Schedule**

|  |  |
| --- | --- |
| Week 1 | Introduction/Group Assignments |
| Week 2 | Overview Lectures (Air and Water Quality)/Group Discussions |
| Week 3 | Overview Lectures (Sanitation)/Group Discussions |
| Week 4 | Group topic discussions and problem definition |
| Week 5 | Progress report due: Includes approach and methodology |
| Week 6 | Group refinement of methods and approach |
| Week 7 | Group meetings and method development |
| Week 8 | Field project dry run in Atlanta |
| Week 9 | Data analyses and class presentation |
| Week 10 | Preparation for trip and group meetings |
| Week 11 | Field work |
| Week 12 | Data analyses and group work |
| Week 13 | Presentation and discussion of preliminary results |
| Week 14 | Continue data analyses and work on final report |
| Week 15 | Final report and presentation preparation |
| Week 16 | Final presentation and poster |