**SLS 3110: TECHNOLOGY AND SUSTAINABLE COMMUNITY DEVELOPMENT**

Instructor: Ellen Zegura (Computer Science) Phone: 404-894-1403

E-mail: ewz@cc.gatech.edu Office: Klaus 3342, TTh 3-4pm  
Past instructors and contributors:

Sabir Khan (Architecture), Wayne Li (Mechanical Engineering/Industrial Design), Dan Matisoff (Public Policy), Betsy DiSalvo (Interactive Computing), Jenny Hirsch (Center for Serve Learn Sustain/History and Sociology)

**COURSE DESCRIPTION:**

When does technology improve communities? When doesn’t it, and why? What else matters in the success or failure of technology-based projects? How can engineers and scientists improve their chances of having a positive long-term impact on communities? What role does public policy and the social sciences have to play? How is designing technology for communities different from designing technology for consumers? This course will explore the role of technology in the development of sustainable communities, locally and internationally. Through a combination of historical perspective, case studies, community engagement methods and practice, and critical evaluation techniques, students will develop an appreciation for the strengths and limitations of technology in sustainable community development and the skills needed to approach sustainable community issues drawing on engineering in context.

This course is part of Georgia Tech’s Serve-Learn-Sustain (SLS) initiative, which provides students with opportunities inside and outside the classroom designed to help them combine their academic and career interests with their desire to improve the human condition, allowing them to help build healthier, more sustainable communities where people and nature thrive.  More information about SLS can be found at [www.serve-learn-sustain.gatech.edu](http://www.serve-learn-sustain.gatech.edu/).  Visit the website to sign up for the SLS listserv and find links to Facebook, Instagram and Twitter.

**OBJECTIVES AND LEARNING OUTCOMES (in italics):**

1. Basics of sustainability: *Students will be able to identify relationships among ecological, social, and economic systems.* This triad forms the basis of sustainability. The course will examine multiple examples of systems that are more or less sustainable, with a special focus on the Proctor Creek watershed.

2. Your role in a big picture: *Students will be able to describe how their actions impact the sustainability of communities.* The course will span multiple scales, from the hyper-local (personal, GT) to the global.

3. Engagement skills and humility: *Students will begin to develop and demonstrate skills needed to work effectively in a community*. This objective will be met via community engagement principles and practicing community engagement methods.

4. Communication: *Students will be able to communicate effectively with the public about creating sustainable communities.* The course will include a culminating module on documenting and communicating learning experiences, suitable for audiences outside the class.

5. Ethics of sustainable community development: *Students will develop an awareness of the ethical issues that arise in sustainability and sustainable community development, as well as an ability to think through the ethical implications of decision making when tradeoffs are required*. Each unit will include ethics topics including environmental justice, the ethics of “helping”, community listening and control over destiny, who decides for a community and ethics in practice.

**READINGS:**

Book (used in part): “Engineering and Sustainable Community Development” by Juan C. Lucena, Jen Schneider, Jon A. Leydens, available for free download here: http://www.morganclaypool.com/doi/abs/10.2200/S00247ED1V01Y201001ETS011

Articles, web sites, etc: We will make these available under Resources on t-square. (See list at the end of this document.)

**INSTITUTE APPROVED AND OTHER ABSENCES:** Individual students may make requests for Institute Approved Absences. The guidelines and deadlines that can be found at <http://www.registrar.gatech.edu/students/formlanding/iaabsences.php> apply. Students should discuss these and other planned absences (e.g. due to major religious observances) with the instructors as soon as possible after the beginning of an academic term. Work missed for these other planned absences may be made up at the discretion of the instructors; students are always allowed to make up for the work missed due to institute-approved absences.

**Learning Accommodations:** The Office of Disability Services assists students self-identifying as having a disability to obtain reasonable accommodations. Documentation of disability is required to determine appropriate accommodations or modifications that may be helpful on campus. See http://disabilityservices.gatech.edu/

**ACADEMIC INTEGRITY:** If you quote, paraphrase, or summarize information in your written assignment that you originally obtained from a written or a verbal source, this source reference should be cited in your text. Questions about appropriate forms of citation can be asked of the course instructor or the reference staff at the library. You should become familiar with the provisions of the Georgia Tech academic honor code and the policies governing violations of the honor code, both published in the Georgia Tech course catalog. For more information, see http://www.honor.gatech.edu.

**GRADING:** Late assignments will not be accepted unless you arrange with the instructor in advance of the due date. Final grades are based on grades for written assignments, participation in class discussions, a project and in-class work. See the following proportion:

Class participation (attendance and active participation): 20%

Reading reflections: 25% total

Other assignments: 30% total

Examples: Visual anthropology exercise, Field observation exercise, Personal water audit

Community event participation and writeup: 10%

Project: 15%

Breakdown: Initial brief, Expert interview, Revised brief, Final deliverables

**GRADING SCALE:** 70-79=C; 80-89=B; 90-100=A

**CLASS PARTICIPATION:** Attendance is required. This is a lecture and discussion course. Student participation will be an important contributor to actively learning and learning from each other. Class participation will be evaluated as follows. Students will be given participation grades at the 5 week and 10 week marks so they know where they stand:

100%: always attend, participating often (at least once every other class), demonstrate mastery of relevant readings and contribute new ideas and perspectives to discussions and exercises

90%: always attend, participating regularly and demonstrate knowledge of relevant readings

80%: always attend but only occasionally participate

70%: attendance irregular and/or participation very rare

**SCHEDULE OF TOPICS:**

**Unit 1: Introduction to Sustainable Communities (3 weeks)**

Ethics Thread: Environmental justice. Throughout this unit we discuss how environmental justice is defined, what case studies highlight a disproportionate negative impact on low income and minority communities, and how consideration of environmental justice may fit in complex decision-making that balances other considerations such as economics.

Week 1: Foundations of sustainability

Readings: Brundtland report, Bullard, Hirsch

Video: EJ video

Week 2: Common pool resources, public policy

Readings: Hardin, Ostrum, Matisoff

Week 3: Case study: fracking simulation

Readings: Fracking background and roles (from Matisoff), McGlynn

**Unit 2: Introduction to Sustainable Development (2 weeks)**

Ethics Thread: Ethics of “help”. Throughout this unit we discuss how the history of engineering and the history of Colonialism have contributed to a divide between the Global North and the Global South on dimensions of power, economic strength, and expertise. We examine how assumptions about expertise and local knowledge affect the success of local engineering problem solving through case studies.

Week 4: History of engineering and sustainable development

Reading: E&SCD Chapter 2 (Engineers and Development)

Week 5: Sustainable development case studies

Reading: E&SCD Chapter 2 (Engineers and Development)

**Unit 3: Design and Community Engagement (5 weeks)**

Ethics Thread: Ethics of working with communities. Throughout this unit we discuss the role of communities in deciding what problems they want solved, what knowledge resources they bring to the table, and what contributions they can make working with outsiders. We discuss techniques for working with communities that respect community members and practices.

Week 6: Design cycle and hands-on design practice

Reading: E&SCD Chapter 3 (Why Design for Industry will not work as Design for Community)

Reading: IDEO design handbook

Video: IDEO grocery cart design

Week 7: Listening and visual anthropology

Reading: E&SCD Chapter 5 (Listening to Community)

Week 8: Participatory design

Reading: Stoeker, Kohl, Freire, Illich,

Week 9: Community engagement foundations

Reading: E&SCD Chapter 4 (Engineering with Community)

Week 10: Community engagement case studies

Video: Wayne’s video on tree dwellers

Textbook:

**Unit 4: Evaluating Projects (3 weeks)**

Ethics Thread: Who decides what is “good”. In this unit we discuss how metrics for evaluating projects serve to privilege one set of values. We examine cases where values reflected in evaluation metrics are in conflict and examine ways that conflicts can be resolved.

Week 11: Quantitative analysis

Video: Ester Duflo TED Talk

Week 12: Qualitative analysis

Week 13: Connecting local and global - water audit and tri-state water wars

Audio: WABE waters segments

**Unit 5: Project (2 weeks)**

Ethics Thread: Ethics in practice. In this culminating unit, students work on a project applying skills they have learned in previous units. Students examine how their own approach to design includes community input and what challenges arise in completing a time-limited assignment while also including varied stakeholders.

Week 14: Project brainstorming and discussion

Week 15: Project presentations

**READINGS AND OTHER MATERIALS**

**Background**

* Report of the World Commission on Environment and Development: Our Common Future (Brundtland, 1987), pp. 9-27
* Bridger and Luloff (1999), “Toward an interactional approach to sustainable community development,” *Journal of Rural Studies*, Vol. 15, 377 – 387.
* Hardin, G. (1986), “The Tragedy of the Commons,” *Science*, Vol. 162, No. 3859, pp. 1243-1248
* Ostrom, E. et al. (1999), “Revisiting the Commons: Local Lessons, Global Challenges,” *Science*, Vol. 284, pp. 278-282
* Matisoff , D. and Noonan, D. (2012), “Managing contested greenspace: neighborhood commons and the rise of dog parks,” International Journal of the Commons, 6(1), 28-51.
* Humphreys, M., Sachs, J. and Stiglitz, J. (2007), Escaping the Resource Curse Chapter 1:What Is the Problem with Natural Resource Wealth?

**Case Studies and Evaluation**

* McGlynn, D (2011), “Fracking Controversy: Are new natural gas drilling methods safe?,” CQ Researcher, Vol 21, Number 44, pp.1049-1072
* Finnegan, W. (2016), “Flint and the Long Struggle against Lead Poisoning,” New Yorker, February 4.
* Flint Water Crisis Timeline, CNN (2016), <http://www.cnn.com/2016/01/20/health/flint-water-crisis-timeline/index.html>
* Tri-state Water Wars: <http://news.wabe.org/term/tri-state-water-wars>
* Esther Duflo Ted Talk, https://www.ted.com/talks/esther\_duflo\_social\_experiments\_to\_fight\_poverty

**Environmental Justice**

* Beloved Community Video: https://spaces.hightail.com/space/50Fv2
* Fried, K. (2014) Seeing Systems: Peace, Justice and Sustainability, Session 3: Justice for the Whole Community, Robert Bullard narrative.
* Hirsch, J. (2008) “New Allies for Nature and Culture: Exploring Common Ground for a Just and Sustainable Chicago Region,” Environmental Justice, vol 1, no 4.

**Working with Communities**

* Stoecker, R. (2013), “The Goose Approach to Research,” Chapter 2 in Research Methods for Community Change.
* Kohl, H. (1992), “I Won't Learn from You: Thoughts on the Role of Assent in Learning,” from Rethinking Schools, vol 7, no 1.
* Freire, P. (1972), Pedagogy of the Oppressed, New York: Herder and Herder, 1972.
* Illich, I. (1968), “To Hell with Good Intentions” in Combining Service and Learning: A Resource Book for Community and Public Service, vol. I, ed. by Jane C. Kendall and associates (Raleigh, NC: Nat. Society for Internships and Experiential Education, 1990), pp 314-320.
* Video on tree-dwellers from Human Planet, segment 4: https://www.youtube.com/watch?v=Dtjo0ZgR5dk
* The pertinent part starts at minute 35:05.

**Human-Centered Design**

* IDEO (2015), The Field Guide to Human-Centered Design
* IDEO shopping cart video on ABC Nightline News: <https://www.youtube.com/watch?v=M66ZU2PCIcM>
* DiSalvo (2012), Adversarial Design, MIT Press

**UPDATED: 05/24/2017**