Technology and Community Sustainable Development
Jose Alfaro
Assistant Professor of Environmental Practice

EAS 501.087
Fall, 2019
3 Credit Hours
Monday, Wednesday 1:00 – 2:30 pm
Office Hours:
By appointment at Calendly.com/jfalfaro

Course Description

More than 1.4 billion people around the world live in abject poverty with income below $1.25 per day. Sanitation, potable water, clean energy services, communication and other infrastructures are not available for these populations. Often “development” is considered as the provision of these services to the communities that need them through technology implementations. However, this ignores the applicability and appropriateness of the technology as well as the desires of the community.

Though well intended, provisions of technological solutions have suffered dismal failure rates. In light of that, this class explores the concepts of development and technology from a community perspective. We examine ways that systems thinking can have transformative potential by having those who will use the technologies take a self-determined path to achieve positive outcomes.

This class challenges the students to view Community Sustainable Development not as something to be done to communities, but as participation in a process with communities. It will define technology transfer, community and development, present the historical background of technological interventions as well as the present state-of-the-art, and provide strategies for using systems thinking for technology transfer. The class will also introduce and make ample use of case studies and procedures developed by Sustainability Without Borders, a SEAS sponsored student organization that has been active in Sustainable Development and technology transfer.

Target Audience

This class is intended for students who are interested in sustainable and international development. Students interested in international environmental careers or project management positions may also find this class useful. If you are interested in working for an NGO, non-profit environmental organization, UN branch or program, USAID, World Bank or similar organizations you will find this class stimulating and it will provide you with skills that you can directly use in your CV and future careers.

The class is structured to challenge both social science and engineering students and facilitate their collaboration.
Learning Objectives
At the end of this class students should be able to:

- Define the concepts of community, technology and Sustainable Development
- Evaluate community needs from a systems perspective
- Apply a systems thinking framework to technology design
- Think critically about the use of technology for development and technology’s capabilities and limitations

The class uses a variety of formats for instruction, including lectures, case studies, readings, group discussions, presentations, pilot scale demonstrations, and a hands-on projects.

Lectures will generally be used to present background information and introduce concepts. The case studies and readings will complement lectures and enhance students’ knowledge of the state of the art. The case studies also form a foundation for the students to create a list of do’s and don’ts in the use of technology for development and in engaging communities.

The group discussion will allow the class to explore its own sense of community and discover its own voice. Small research assignments and other homework will be provided as preparation for these group discussions.

Team projects will allow the students to develop hands-on experience with project development.

Grading Rubric

<table>
<thead>
<tr>
<th>Component</th>
<th>% of Grade</th>
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<tbody>
<tr>
<td>Participation</td>
<td>5</td>
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<tr>
<td>Homework Sets</td>
<td>15</td>
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<tr>
<td>Midterm Exam</td>
<td>20</td>
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<tr>
<td>Case Study Critique</td>
<td>10</td>
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<tr>
<td>Final Project</td>
<td>30</td>
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<tr>
<td>Oral Presentation</td>
<td>30% of Project Grade</td>
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<tr>
<td>Written Report</td>
<td>70% of Project Grade</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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<tr>
<td>Total</td>
<td>100</td>
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## Tentative Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Subject</th>
<th>Notes</th>
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<tbody>
<tr>
<td>3</td>
<td>9/16 - 9/20</td>
<td>Introduction, History and Definition of Concepts: Development, Community, Technology.</td>
<td>Assignment 1 due 9/16th</td>
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<td>4</td>
<td>9/23 - 9/27</td>
<td>Systems Thinking Frameworks for Community Development: Community Capitals Framework</td>
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<tr>
<td>5</td>
<td>9/30 – 10/4</td>
<td>Systems Thinking Frameworks for Community Development: Community Capitals Framework</td>
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<td>6</td>
<td>10/7- 10/11</td>
<td>Systems Thinking Frameworks for Community Development: Community Capitals Framework</td>
<td>Assignment 2 due 10/7</td>
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<td>7</td>
<td>10/14 – 10/18</td>
<td>Fall Break and Midterm</td>
<td>10/14 Fall Break</td>
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<td>8</td>
<td>10/21 – 10/25</td>
<td>Appraising and Listening to Community</td>
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<td>9</td>
<td>10/28 – 11/1</td>
<td>Creating a Project: Baseline and Human Centered Design</td>
<td>Assignment 3 due 10/28</td>
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<tr>
<td>10</td>
<td>11/4 – 11/8</td>
<td>Project Planning and Management</td>
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<td>11</td>
<td>11/11 – 11/15</td>
<td>Case Studies and Practitioner's Perspective</td>
<td>Case study critiques in class</td>
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<td>12</td>
<td>11/18 – 11/22</td>
<td>Top down and Bottom Up Technology Transfer: National Technology Needs Assessments</td>
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<td>14</td>
<td>12/2 – 12/6</td>
<td>Technology Examples: Energy, Water, and FEW</td>
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Required Readings

Human needs


What is development?

  o Page 1-16
  o Pages 1-25 (the Overview)
  o Browse the statistical annex starting on page 203

Technology and its history in development


Defining community


Systems Thinking

Development Frameworks


Appraising and Listening to Community


Required Viewing
- Blindsight. Dir. Lucy Walker. Robson Entertainment, 2006, Film.

Creating a Project


Additional Resources and Further Reading
- Green Growth Knowledge Platform
- Sustainable Development Knowledge Platform http://sustainabledevelopment.un.org
- Zero Emissions Research Initiative http://www.zeri.org/ZERI/Home.html
- Gaviotas, book and website  http://www.friendsofgaviotas.org
  - Page 1-18
  - Browse the statistical annex starting on page 140