Technology for Developing Communities (TDC)
16-871/17-899

Fall 2006

1. *Instructors:*

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2. *Consultants:*

Name	*Office*	*Phone*	*Email*
Joe Mertz	HBH 3022	8x2504	joemertz@cmu.edu
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3. *Course Objectives:*

The ultimate goal of this course is to encourage students to become both deeply motivated and reflective about the role that technology can play in improving the lives of people living in developing communities. Students will be encouraged to break away from us/them dichotomies to see the process of introducing technology into developing communities as a partnership between community members and technology-specialists, not a one-way street. Issues of sustainability, local appropriateness, and cultural sensitivity will be fore-grounded. The course will also encourage interdisciplinary approaches.

4. *Course Units:*

You will earn 12 units for successfully completing this course.

5. *Class Hours:*

Tuesdays and Thursdays:
9:00a.m. – 10:20a.m. in Wean Hall 4615A

6. *Office Hours:*

The instructors will hold office hours as needed. In general, send the instructors email if you wish to meet with them, and they will arrange to meet with you.

7. *Textbooks:*

This course has no required textbooks.

8. *Website:*

Course website: www.techbridgeworld.org/tdc.html
This website will be frequently updated with assignments, lecture notes, readings for class, useful links, answers to frequently asked questions, helpful hints, etc. Make sure you visit the web site frequently.

9. Other Course Resources:

In addition to the web page, the following resources will also be available to you:

- distribution email list for the class:
- electronic drop box for assignments: https://handin.intro.cs.cmu.edu/

Other resources may be added during the course of the semester.

10. Grading Policy:

Each student's grade will depend entirely on his/her performance on assignments, class participation, and the final project; there is no final exam. For group assignments, the entire group will receive the same base grade; however, adjustments to this base grade may be made for individual grades at the instructors' discretion, based upon assessment of individual contribution to group assignments. In all cases, the instructors' decision of the grade is final – you may ask for clarification or supply additional information in support of a request to change a grade, but any modification is entirely at the instructors' discretion.

Your course grade will be determined as follows:

- **Class Participation: 10%**
  - Overall participation (in class and online)
  - Assessment Assignment
  - Student debates
- **Homework: 40%**
  - HW 1: Development 5%
  - HW 2: Capacity Building 5%
  - HW 3: Economics 8%
  - HW 4: Case Study 8%
  - HW 5: Simulation 14%
- **Project: 50%**
  - Preparation 10% (topic, abstract, outline)
  - Presentation 15%
  - Report 25%

11. Assignments:

In general, the assignments in this course will test your understanding of course material, your creativity and innovativeness in problem solving, and your basic skills relevant to the course topic. Have fun with your assignments and project and be creative! Try to learn as much as you can from each assignment! **Assignments are due at the beginning of the class on the due date.** Any required demonstrations will be scheduled and announced before the due date. The homework assignments will also draw from the readings, which are also important for class participation.

12. Late Work:

We will accept assignments up to 48 hours after the due date but you will incur a loss of 1 point for each hour past the due time (each assignment will be scored on a scale of 0 to 100 points). After 48 hours you will receive a 0 for the assignment unless you have extenuating circumstances or have gained prior permission for a late submission from the instructors. A good rule to follow is that you should request extensions well before the due date/time rather than at the last minute. Extensions will only be granted for valid reasons at the discretion of the instructors. If you need to turn in an assignment late, it is your responsibility to make sure the instructors receive the assignment before the 48 hour deadline – make sure you get an acknowledgement from one of the instructors before the deadline has passed. Similarly, if you need to demonstrate something past

the due date, it is your responsibility to schedule a time with the instructors for your late demonstration. In general, it is in your best interest to complete assignments on time.

13. Collaboration:

In each assignment, the instructors will make it clear how much collaboration is acceptable. If you are assigned a group assignment, you may collaborate with other students in your group, but you may not collaborate with students in other groups unless you are told otherwise by your instructors. You are expected to understand all parts of a group assignment including the components you did not personally complete. In general, we encourage discourse among students and discussion of abstract ideas. Feel free to talk to each other about approaches to problem solving, but do not solve specifically assigned problems for others unless the instructors give you permission to do so.

14. Acknowledgements and References:

Always make sure you acknowledge your collaborators and others who help you in any written or oral assignment. In general, you should be generous in acknowledging contributions of others. Also make sure you include adequate references to publications, communications, and websites that you use to support different claims in your written and oral assignments. Most arguments are made stronger by supporting citations. We have a strict policy on plagiarism in this class.

The following is a very good discussion on plagiarism and how to avoid it, authored by Adjunct Professor Laura Hastings and distributed to Heinz faculty via email:

Plagiarism

Cases of cheating and plagiarism, and unauthorized collaboration will be handled in accordance with CMU guidelines. You will get in trouble. What is plagiarism? Plagiarism is defined as "the act of passing off as one's own the ideas or writings of another."
Three simple conventions are presented for when you must provide a reference:
If you use someone else's ideas, you should cite the source.
If the way in which you are using the source is unclear, make it clear.
If you received specific help from someone in writing the paper, acknowledge it.

The following is excerpted from The Georgetown University website
http://gervaseprograms.georgetown.edu/hc/plagiarism.html)

They Said It So Much Better. Shouldn't I Use Their Words?
Yeah, and Michael Jordan can hit a fadeaway jump shot better than you can, and Miles Davis could play a better blues than you do on the trumpet.
Learning to write is learning to think.

Sure you won't have a lot of original thoughts, very few of us do. But you will have your original way of looking at things, which is a combination of everything you have done to this point in your life. As you read others' works and ponder, argue with, distill, reconcile yourself to, or reject them, you are growing intellectually, just as you would grow physically by lifting weights or playing the piano.

I thought I can use someone's words if I reference or cite the source.
You can, and this happens all the time in academia. It is necessary for building upon the works of others. The trouble comes when you start to use someone else's words all throughout your paper. Pretty soon your paper looks like nothing but a field of quotation

marks with a few country roads in between (your few sentences) connecting them. This does not represent very much intellectual work on your part. You have assembled a paper rather than writing one.

My Friends Get Stuff From the Internet
So do you, so do I, so does everybody. According to the April 3rd, 1998 issue of Science (and that's a long time ago), there are now as many as 350,000,000 pages on Internet, and with plans in existence for putting everything in libraries in digital form, the accessibility of virtually any text will become a reality in the not-too-distant future. This means that the temptation to start with someone else's words in a word processor and massage them into a paper will become greater and greater.

The practical consequence of all this information in electronic form is that you will be tempted. You'll find out there are sites where you can download whole papers, and you'll be able to find articles about many topics within a moment's notice. Of course your professors have access to these same tools with the same lightening quick speeds (perhaps even faster with their on-campus Internet access). But that's not the point. You're not in college to play a cat and mouse game with your professor to see if you can fool him or her by using someone else's work. You are in college to hone your mind into a reliable thinking machine that will serve you well throughout the rest of your life. This is the number one skill you are here to obtain: thinking.

A Citation is Not a Traffic Ticket
Before we even get to the idea of citation, let's make sure one thing is clear: if you are using a word-for-word, literal quotation, you have to put the passage you are quoting in quotation marks. If it is a long passage – more than three lines of text in your paper--you should start a new line and indent, putting the citation at the end of the paragraph. Only these two mechanisms are acceptable for indicating quoted material.

There are several systems for citing, or giving reference to, the ideas of others. All professors want you to present complete information. You should give the author's name, the name of the book, the publisher, the date and place of publication, and the page number of the quotation. The whole reference allows the reader to track it down and see what it says for him or herself. It's part of the scientific paradigm that is prevalent in Western societies, which says that convincing evidence about the truth of a hypothesis can be built up only by amassing several independent direct or indirect confirmations of the hypothesis. If I can track down the source, I can see for myself whether I think it is valid.

Citing books and magazines isn't too hard, but what about stuff like web pages?
I try to reference the TITLE of the page, at the top of the document (or perhaps at the topic of your browser window, the URL of the page (its location on the web), the AUTHOR of the page if you can find one (or an organization if it appears that an organization wrote the page), the TITLE and DATE of the broader work if you can discern it, and the date on which you visited the web page.

15. Attendance and Class Participation:

You are not required to attend classes and we won't be taking attendance, but the instructors highly encourage your attendance at all lectures. It will be up to you to make sure the instructors are aware of your contributions to the class, both in-class and online, in order to earn a high grade for class participation.

16. Laptops:

Student use of laptops during class is at the discretion of the instructors. When permitted, they should only be used to enhance class involvement and learning. No email, chat, or other non-class related surfing is permitted.

17. Course Description:

This graduate course studies meaningful ways to use advanced technologies to support developing communities worldwide. It focuses on communities that include the poorest 4 billion people: people who today lack access to modern technologies and infrastructure. We focus on the broad space of computing, information and communications technologies which include robotics, sensor networks, etc. Underserved communities exist throughout the world, and we will also briefly discuss divisions within countries, including the United States.

The course provides an overview of social and economic aspects of development as well as technologies in the context of development. A key goal is examination of advanced technologies as applicable to sustainable development.

Because of the nature of the subject, this course will be broad and interdisciplinary. It will cover the basics of technology, economics, and policy, and we expect students to explore specific areas of interest in depth on their own (from a technical, policy, or interdisciplinary perspective). Each student will carry out a project of the student's design, working individually on in small groups. Example topics for student projects have included: participatory GIS for empowerment, critique of the $100 Laptop, developing a computer-based English literacy tutor for Ghana, and a cost-benefit analysis of pre-paid metering for water in developing countries.

This course has no pre-requisites, and is open graduate students in all disciplines. There will be no final exam, and the project will make a significant portion of the grade. This class has been taught several times previously (under slightly different names – ICT4B and T&D4B) and students have gone on to publish their project work or expanded it into further research.

18. Project:

Final project reports will be due by noon on December 15, 2006!

19. Course Schedule:

Note that the instructors may alter the schedule during the semester to account for different circumstances – all schedule modifications will be announced in class and on the course webpage.

Week	***Tuesday***	***Thursday***
1	*August 29:* Welcome and introduction **Assessment Assignment**	*August 31:* The state of the world
2	*September 5:* Challenges faced by developing communities ***Assessment Assignment due*** **Student debate teams assigned**	*September 7:* Challenges faced by developing communities
3	*September 12:* History and politics of development **Development HW**	*September 14:* History and politics of development
4	*September 19:* Basic economic theories	*September 21:* Capacity building ***Development HW due***
5	*September 26:* Capacity building **Capacity Building HW**	*September 28:* Planning for sustainability **Introduction to final project**
6	*October 3:* Global technology trends **Topic/teams assigned for second debate**	*October 5:* Technological systems and infrastructure ***Capacity Building HW due*** **Simulation HW introduced**
7	*October 10:* Practices in technology design ***Final project teams and topics due***	*October 12:* Technology for developing communities
8	*October 17:* Evaluating the impact of ICT projects **Economics HW** ***Final project 1-page abstracts due***	*October 19:* Techno-economic analysis ***Simulation HW report 1 due***
9	*October 24:* Mid-course project update ***Student debate on the $100 Laptop***	*October 26:* Legal and political context ***Economics HW due***
10	*October 31:* The role of entrepreneurship	*November 2:* Microfinance and access to markets
11	*November 7:* Education **Case Study HW** ***Final project optional mid-term reports due***	*November 9:* Education ***Simulation HW report 2 due***
12	*November 14:* Food and agriculture	*November 16:* Food and agriculture ***Case Study HW due***
13	*November 21:* ***Second student debate***	*November 23:* **No Class: Thanksgiving Holiday**
14	*November 28:* Health and medicine	*November 30:* Health and medicine

15	*December 5:* Student discussion on lessons learned and future directions	*December 7:* Final discussion: lessons learned and future directions
Finals	***Final project presentations during the course finals slot: December 12, 8:30-11:30am.*** ***Final project reports due by noon on December 15 – no extensions!***	