Course description: This course reviews fundamentals of Information and Communication (ICT) for development, with a focus on policy-making, regulation and strategy building. It covers international perspectives and case studies from Africa. It teaches the economic, social, and political role of ICTs in the development dynamic and asks what can be done to reap the full benefits. Topics include digital innovation, conceptual frameworks of digital transformations, national policy strategies, ICT regulation and market structure, broadband technology, and significant applications, such as e-government.

This curriculum was prepared under the auspices of the Center for Global Communication Studies, Annenberg School for Communication at the University of Pennsylvania. It was developed in partnership with infoDev with funding provided by the Ministry for Foreign Affairs of the Government of Finland and the Carnegie Corporation of New York.* No prerequisites. Teaching language: English.

Overview: The advent of digital Information and Communication Technologies (ICTs) has changed the lives of all people around the globe (directly and indirectly). In less than two decades, 3 out of 10 people worldwide have linked up through the Internet, and 9 out of 10 have connected with mobile telephony. Our generation has the luck (or responsibility) to live through and shape an era in which information and communication have become the driving force of human progress. ICTs are the most powerful and also the most tangible tools to exploit the resultant opportunities. We ask: What are the fundamental changes introduced by these technological tools? Since ICTs are tools that are means to specific ends, what kinds of ends can be pursued through ICT? How can ICT contribute to the economic, social, and political development of a society? What is required in order to reap the benefits of digital activities? What is currently done about it? How is it that some members of society are already more advanced than others in deriving benefits from the digital age? How can we bring the benefits of these technologies to everybody? What are the market dynamics of digital industries and what are the best practices in regulating them? What is happening in African countries like Ethiopia, Kenya, Mozambique, Nigeria, Rwanda, South Africa, Tanzania, and Zambia? What is missing in these countries? How can they become full-fledged members of the global information society? We also look at some more advanced topics and ask: How can we develop a thriving broadband ecosystem? How can mobile phone or fixed-line broadband networks be incentivized and regulated? Can the digitization of government procedures act as a catalyst of digital development?

Course Objectives: This course will (1) provide students with a critical understanding about the role of ICTs for social, economic and political development; (2) provide analytic skills that allow students to understand and critically engage with the complex and often conflicting policy debates about ICTs; and (3) provide an understanding of the dynamics and regulation of some of the most prominent industries and applications.

Since the transformative effects of ICT can currently be felt in all aspects of social, economic, political and cultural life, this course is not tailored to one particular kind of audience. Students interested in studying ongoing social transformations in future graduate study or law school will benefit as much from the course as those planning to work in the private sector, or in the governmental agencies or NGOs. This interdisciplinary seminar will employ scholarship and perspectives from economics, law, communication, development studies, information science, political science, and elsewhere. No previous coursework in this area or technical knowledge is required.

The course will be structured as a series of reading and discussion sessions that culminate in a seminar paper or project whose topic may be chosen by the student. Since ICTs touch every aspect of human conduct and development, the list of possible topics is as long as the list of transformations provoked by the digital age. The only requirement is that the elaboration of the topic is heavily policy oriented. This means that the student should both analyze an issue and discuss what is and/or can be done about it. For example, students can pick one specific aspect of telecommunications regulation or e-government development, and elaborate on the current opportunities and challenges, and on existing policies, programs and projects in this area.

* This publication was made possible in part by a grant from the Carnegie Corporation of New York. The statements made and views expressed are solely the responsibility of the author.
NOTE FOR INSTRUCTORS
(This 2-page box is to be deleted by the instructor before circulation of the syllabus!)

This example syllabus was jointly developed by the partners of the ICT Policy and Training Initiative. The
instructor is free to change it according to individual preferences.

LEVEL AND FORMAT: This course is intended to be delivered through an academic institution to
graduate students and professionals, but can be adjusted by the instructor for advanced undergraduate
students. While the curriculum can be incorporated into an existing academic course, ideally the course
will be taught as a stand-alone course or a professional/continuing education course where both
master’s level students as well as professionals would enroll and participate. The syllabus is designed for
one session per week. If classes are taught twice per week, the reading load and the syllabus can be
adjusted accordingly.

READING LOAD: The syllabus provides mandatory and complementary readings. The mandatory
reading provides a reading load of about 100 pages per week, which is demanding but
standard for
graduate courses at leading research universities (i.e. 20 pages per day). It can be reduced for advanced
undergraduate students. Many of the listed readings contain page number instructions (point this out to
students!), which limits the reading load while exposing students to a wider field of literature, which can
be explored individually. Occasionally, the mandatory reading is divided into different groups of
literature. Students should sign up for (or be assigned to) one of them according to interest and then
report the content to fellow students during the next session. This exchange expands the review of
literature without increasing the reading load to an agonizing level. It also leads to complementary class
discussions. If the instructor deletes/changes the page number instructions and/or exchanges/prioritizes
readings, the reading load will naturally change and should be recalculated.

KEYWORDS: Several keywords are suggested for each session and students are encouraged to look
them up on collective sites like Wikipedia before class. This allows students to get a feel of the general
public opinion about the issues that will be discussed and fosters their self-initiative for personal
research. As such, students should always approach Wikipedia material critically.

VIDEOS: Several online videos are suggested for each session. It is up to the instructor to make this a
mandatory or voluntary part of the class preparation and/or to incorporate their content into the class
discussions or not. The instructor might also show (excerpts of) selected videos during class and discuss
them collectively. Online videos sometimes present personal opinions and should be reviewed critically
by students.

READING AVAILABILITY: One of the aims of this syllabus was to assure that all mandatory
readings are readily available online to the students free of charge. The only exception to this norm is
Everett Rogers “Diffusion of Innovations” (5th Edition), which should be available in University Libraries.
If the book cannot be obtained, an online link is provided to the (less complete) 3rd edition of the book.

READING QUESTIONS: Each of the mandatory readings is accompanied by reading questions. The
instructor can choose to delete them, have students answering them through a written online exchange
before class (e.g. on a class blog or through a collective group Email), or to discuss them in class. For
lower level students, the division of questions among students will lower the work load, while advanced
grade-levels should be able to answer all reading questions. In cases where this class is taught several
years in a row, it is recommended to modify the questions slightly.

HYPERLINKS: The syllabus contains many hyperlinks, which encourages students to connect directly
to the Internet themselves to find material. The instructor is strongly encouraged to review the validity of
those links before sharing the final version of the syllabus.
**FINAL PROJECT:** The final project of this course consists of an individual research project. For graduate students, a short presentation and a research paper is adequate. For undergraduate students both can either be done collectively or one of them can be deleted.

**SPECIAL INSTRUCTIONS:**

**WEEK 1:** The first week contains relatively little reading and no reading questions, since experience shows that most students tend not to do any work before concrete instructions are given during the first class. However, all students should be encouraged to read the assigned material (the quicker the better), since they provide a good overview. Besides introducing the topic and the course and having each student present her/his personal relation to and interest in the topic, a possible exercise for the first class is to give students 45-60 min to write a confidential letter to themselves in which they answer questions like:

- What are information and communication technologies (ICTs)? Are radio and Facebook part of it?
- What is (under)development? What is poverty?
- What can ICTs do to foster development? What to fight poverty?
- What is being done about it? What should be done about it?
- What are the most important challenges right now? Where to set the focus?
- What will the future look like in 50 years from now? In the world? In our country?

These letters can be sealed by the students themselves in individual envelopes, collected by the instructor, kept in a confidential manner, and returned to the students at the end of the semester. Experience has shown that this exercise is helpful for a topic like ICT Policy which is both relatively new and technical, but nevertheless quite well-known in popular culture: it takes the fear of the technical aspects by showing that everybody knows something about radio and TV, or Facebook and Google. Besides, being contrasted with their often vaguely formulated statements and thoughts at the beginning of the semester, students will realize at the end of the semester how much they actually learned (which is important for a seminar like this that does not include concrete test results).

**WEEK 4 & 9:** The reports from ITU, UNCTAD, World Bank, OECD and WEF, as well as the ones from UN-DESA and Freedom House are annual, bi-annual or tri-annual reports and the instructor is encouraged to replace them with the newest version of the report if it is available (see provided links).

**WEEK 5 & 7:** During week 5 students should start thinking about their research topic and by week 8 they should define it. It is suggested that topics are posted somewhere online (e.g. on a class blog or through a collective group Email).

**WEEK 11:** No reading is formally assigned for this week. Each student lists 3 readings (journal papers, official reports, book (chapters)) that relate to her/his selected research topic. Students should post these selected readings online (i.e. on a class blog or send them to a group Email) and quickly (5 min) report on them.

**MORE THAN 10 WEEKS:** If there are more than 10 weeks, the remaining sessions can be used for class presentations about the students’ ongoing research projects. Alternatively, some session could be split. For example, the reading material and the accompanying discussions of WEEKS 2 and WEEK 5 could certainly be extended over two weeks (i.e. incorporating more of the Report on Monitoring the WSIS Targets from WEEK 2 and extending the reading from the ICT Regulation Toolkit from WEEK 5.

In case you have **specific questions** on the execution of the syllabus, feel free to contact: Martin Hilbert (Dr., PhD); martinhilbert[at]gmail.com; [http://www.martinhilbert.net](http://www.martinhilbert.net) who will make his best effort to answer arising questions.
OVERVIEW and KEY QUESTIONS

WEEK 1- INTRODUCTION
What are some of the profound social changes that came with the impressive growth in the world’s technological capacity to handle information and communication?

WEEK 2- DEVELOPMENT AND COMMUNICATION
Since ICTs are means to specific ends, we have to discuss the nature of the ends, i.e. development. What is development? What is the historical context of using communication technology for development and what are some recent ICT Policies?

WEEK 3- CONCEPTUAL FRAMEWORKS
What are the relevant building blocks of the ICT paradigm? How do national and international policy agendas approach such far-reaching changes?

WEEK 4- STATE OF THE ART
What is the current state of the art of different aspects of global ICT development?

WEEK 5- DIGITAL DIVIDE
How do digital technologies spread throughout society? What are the characteristics of the demand side of the diffusion process?

WEEK 6- TELECOM REGULATION
What can be done on the supply side of the diffusion process to facilitate the provision of digital products and services?

WEEK 7- AFRICA: ICT potential and infrastructure
What are the digital development trajectories and infrastructure challenges of Africa?

WEEK 8- AFRICA: ICT potential for the marginalized
What are the current challenges for poverty reduction and the inclusion of marginalized groups in Africa?

WEEK 9- BROADBAND
What are the particularities of the broadband revolution and what to do about it?

WEEK 10- e-GOVERNMENT
What are the opportunities and challenges in the digitization of governmental processes? What is the current status of Internet freedoms in Africa?

WEEK 11- REVIEW and CONCLUSIONS
**WEEK 1 - INTRODUCTION TO THE COURSE**: an overview of the ICT paradigm

**Keywords** (look up at: www.wikipedia.org): “ICT4D”; “Information Society”; “Information Age”.

**Videos**: Global Growth of Information (4min); Company’s call for ICT Policy (2min); Threats and Opportunities for Global Development (5min); Dan Schiller on Digital Capitalism in Crisis (63 min).

ICT led to an impressive growth in the world’s technological capacity to handle information and communication. This has led to **profound changes** in the way society works.


**Week 1 COMPLEMENTARY OPTIONAL READINGS:**


WEEK 2 - DEVELOPMENT AND COMMUNICATION: concepts and history


Videos: Stats reshape our worldview (20min); Amartya Sen interview (6min); Problems with GDP (8min); Human Development Index (HDI) (9min); MDGs (4min); HDI to measure development? (14min); Economics of Happiness (4min); Development Communication? (1min); ICT4D interview (2min).

ICT are means to specific ends. Before studying the means, any policy has to be explicit about the pursued ends. We start by asking broadly: what is development?


Reading questions:
(1) What are concrete examples of Sen’s 5 instrumental freedoms?
(3) How can “information” and “communication” be a “capability” in the sense of Sen? Concrete examples?

The idea of fostering communication for development is not new. So-called “Development Communication” research during the 1960s and 1970s set the ground for most existing ICT Policy programs and institutions and provides the historical context of current dynamics.

One of the following:


Reading questions:
(1) What do these studies from the 1970 define as the “old” and the “new” development paradigm? Do modern digital ICT tend to foster one of the other? Is there a new paradigm?
(2) What are the mentioned limitations of the technologies available in the 1970s? How could modern digital technologies overcome some of them? Current examples from your country?

Finally we review a recent example of global ICT Policy in the light of development theory.


Reading question:
(1) What are the ingredients of “development” defined by WSIS? What indicators would you select for a “Human WSIS Index”? Would you add or replace some?
WEEK 3- CONCEPTUAL FRAMEWORKS: building blocks of policies in the digital age

Keywords (look up at: www.wikipedia.org): “Kondratiev waves”; “Creative Destruction”.

Videos: Carlota Perez (4min); ICT ecosystem (13min); Leading Dev & ICT intellectuals (84min).

Keeping both the technological means and the social ends in mind, we discuss conceptual frameworks that show the “Big Picture” of the relevant building blocks of the ICT paradigm.


Reading questions:
(1) While Hilbert views “social change” as the result of ICT diffusion, Wilson views “social structure” as the cause for ICT diffusion. Contrast both. Which is the chicken and which the egg: technology or society?
(2) What does each author say about the importance of policies?
(3) Provide concrete examples from the digital paradigm to flesh out Perez’s 3 interconnected processes of change and adaptation.

Week 3 COMPLEMENTARY OPTIONAL READINGS:


The all-embracing nature of the ICT paradigm forces respective policy agendas to be just as comprehensive and far-reaching.

One of the following:


Reading questions:
(1) What are the main characteristics of a national ICT strategy?
(2) What is the role of the development of ICT infrastructure in relation to other areas?
(3) What do you think are the 3 most important policy areas and why?
Week 3 COMPLEMENTARY OPTIONAL READINGS:


WEEK 4 - STATE OF THE ART: reviewing current perspectives on an ongoing dynamic

Keywords (look up at: www.wikipedia.org): “ITU”; “UNCTAD”; “World Bank”; “OECD”; “WEF”.

Videos: ITU Sec. General 2009 (5min); Where was this Google all this time? (7min); How Mobiles, Facebook and Twitter make history (16min); ICT4D at Penn (lectures); Berkman Center (several).

Being equipped with critical awareness about the most important theoretical and conceptual aspects, we review the current state of the art of different aspects of global ICT development.

Select one of the following reports:


Reading questions:
(1) What are the main messages of the report?
(2) What aspects are missing in the report?
(3) What are the most fascinating things you’ve learned?
Week 4 COMPLEMENTARY OPTIONAL READINGS:

Each of these reports is a recent version of a series of annual reports. Each new version of the report focuses on different issues. Review other/former reports to brain-storm about their own research:


UNCTAD Information Economy Reports since 2001: [http://r0.unctad.org/ecommerce/docs_en.htm](http://r0.unctad.org/ecommerce/docs_en.htm)


The OECD Internet Economy Outlook replaces the former OECD Information Technology Outlook, which was published since 2000: [http://www.oecd-ilibrary.org/science-and-technology/information-technology-outlook_19991444](http://www.oecd-ilibrary.org/science-and-technology/information-technology-outlook_19991444)


**WEEK 5- DIGITAL DIVIDE: diffusion of ICT**

**Keywords** (look up: www.wikipedia.org): “Digital Divide”; “Diffusion of Innovations”; “Global Digital Divide”.

**Videos**: Rural digital divide in Honduras (3min); Digital divide in U.S. (2min); Brainstorming on solutions (2min); Watch an innovation diffuse in 3 min (3 min).

All innovations, including ICT, spread slowly and unevenly throughout society, which inevitably creates a divide between those that already have access and use it, and those still excluded. We start by reviewing the demand side of the diffusion process.


Tom Valente (2010), Diffusion of Innovations: Network Analysis, VideoPart1 (10min); VideoPart2 (9min); VideoPart3 (10min).


Reading questions:

1. Choose one example of a specific ICT and walk step by step through Rogers diffusion process (Figure 5.1/ Table 5.1)
2. What are “social networks” and what do they have to do with the digital divide?
3. What are the most significant socio-economic variables that determine Internet access?
4. Based on evidence from the U.S., South Korea and Chile: what percentage of national public sector ICT policy budgets is dedicated to ICT infrastructure?

**Week 5 COMPLEMENTARY OPTIONAL READINGS:**


Hilbert, M. (2010), When is cheap, cheap enough to bridge the digital divide? World Development, 38/5, 756-770; http://www.martinhilbert.net/CheapEnoughWD_Hilbert_pre-print.pdf

Time to start thinking about your class paper research topic!!!
WEEK 6- TELECOM REGULATION: supplying ICT products and services


Videos: Africa 2012 - Accelerating Infrastructure Investments (67min); Introduction structure regulation and competition in the telecom sector (82 min).

After understanding the demand side of the ICT diffusion processes, we focus on the supply side of digital products and services. Telecommunication networks are installed and constantly new technologies are introduced. This process is not automatic, but a tightly regulated dynamic.


Reading questions:

(1) What is the role of an ideal regulator and what are some of its institutional characteristics?

(2) Why is it so important that a telecommunication regulation landscape is stable and predictably in the long term?

(3) What is ICT convergence and what’s its impact on regulation? What does it mean when regulators converge and what are some of the related challenges?

(4) What are:
   - radio spectrum and spectrum management?
   - telecom incumbent and incumbent network?
   - monopoly and oligopoly?
   - barriers to entry?
   - customer lock-in?

(5) What do Calandro & Moyo suggest to improve the roll-out and extension of national broadband backbone networks in Africa?

Week 6 COMPLEMENTARY OPTIONAL READINGS:

WEEK 7 - AFRICA: ICT potential and infrastructure

Videos: The Challenges of ICT Development in Africa (11min); ICT Bridging Development Gap for Africa (9min); ICT Growth in Africa (6min); ICT Growth for Business in East Africa (5min)

We take a closer look at the digital development trajectories and infrastructure challenges of Africa.


Reading questions:
(1) What is the most (a) surprising; (b) important; (c) worrisome ICT statistic in South Africa?
(2) What are the most interesting things you learned from the 2 Sector Studies you chose from Part II of the World Bank report?
(3) What do you think are the 2 most important recommendations from Chapters 8 & 9 of the World Bank report? Back your opinion up with evidence from the report.

One of the following 4 reports:


Reading questions:
(1) What are 3 particularities you learned about in the telecom market you chose to study?
(2) Is there a universal access policy in the country? What does it consist of?
(3) What do you think is the largest challenge in the telecom market you chose to study?

Week 7 COMPLEMENTARY OPTIONAL READINGS:


Time to decide on your class paper research topic!!!

**WEEK 8- AFRICA: ICT potential for the marginalized**

Videos: [ICT and the BPO Industry in Kenya](#) (4min); [Technology for Development: No Shortcuts](#) (18min); [Ten Myths of ICT for International Development](#) (45min);

We take a closer look at the digital development trajectories and challenges for **poverty reduction** and the **inclusion of marginalized groups** in **Africa**.


**Reading questions:**
1. Explain some relationship between ICT access and use and the multidimensions of poverty
2. Explain the money making potential of mobile “reachability”
3. What kinds of sacrifices do Kenyans make in order to purchase mobile airtime?

One of the following 2 articles:


**Reading questions:**
1. Report on the impact of mobile phones on micro-enterprises

One of the following 2 articles:


**Reading questions:**
1. Why do women effectively access and use less ICTs than men?
2. What are some of the opportunities of ICT to improve existing gender divides?

**Week 8 COMPLEMENTARY OPTIONAL READINGS:**

WEEK 9 - BROADBAND: fixed and mobile

Keywords (look up at: www.wikipedia.org): “Broadband access”; “Wireless broadband”
“Mobile broadband”; “Broadband universal service”; National broadband plans from around the world”; “radio spectrum.”

Videos: Lagging U.S. (3min); Broadband Convergence (5min); Toward wireless broadband? (2min);

Access to the digital realm is no longer a binary yes-no decision, but transforms into a moving target of ever increasing bandwidth. Many useful applications only become possible with a certain level of bandwidth.


Reading questions:
(1) What is broadband? What are different statistical definitions of broadband? How do you think it will be defined in 20 years from now?
(2) What are 2 examples of how broadband can contribute to development where narrowband couldn’t?
(3) What is the role of government in broadband development? What of this is missing in African countries?

One of the following:


Reading questions:
(1) What are the most surprising/impressive things you have learned?
**Week 9 COMPLEMENTARY OPTIONAL READINGS:**

Broadband Strategies Toolkit: [http://broadbandtoolkit.org](http://broadbandtoolkit.org)


Log in and download latest report

WEEK 10- e-GOVERNMENT: the public sector as digital catalyster

**Keywords** (look up at: [www.wikipedia.org](http://www.wikipedia.org)): “e-Government”; “Civil Sector Reform”; “Corruption Perceptions Index”; “Public participation”; “Open Government.”

**Videos:** eGov Revolution (9min); e-Gov Applications (5min); Interoperable Europe (2min); Interoperable EU e-Gov. (3min); Open Government Partnership (3min); UN e-Gov. online portal (2min);

The government not only helps to guide the transition of society as a whole, but it is subject to the ongoing digital transformations itself. The **digitization of the execution of the law** by the executive branch is a central ICT policy area.


Reading questions:
(1) How are the UN-DESA “Online Service Index” and the “Supplementary e-Participation Index” constructed?
(2) What role do you think e-government development plays for the general transition of a country toward the digital age?
(3) Of the different examples given in the report, which is your favorite e-government application, website, or service? Why?

The digitization of the public sector is not automatically empowering and democratic. As early as 1948, long before academics started to talk about the “Information Society”, the novelist George Orwell wrote a novel about a dark vision of the information age (“1984”), where “Big Brother is watching you”. We review the current status of **Internet freedoms in Africa**.


Reading questions:
(1) What have you learned about Internet freedoms in the country? What is the government’s role?
Week 10 COMPLEMENTARY OPTIONAL READINGS:


Each of the previous reports is a recent version of a series of annual reports. Each new version of the report focuses on different issues. Review other/former reports to brain-storm about their own research:


WEEK 11 - CONCLUSION: Review and overview of individual research projects

Today we will review both the existing material and the research topics you selected for your class paper.

Bring your course notes and annotated reading material, as we will review each session and talk about what you got out of the different topics we discussed.

Select 3 Journal articles, Book Chapters or official Reports (see links below for example) that relate to your research topic and quickly present the main messages in a few minutes. Put an effort into synthesizing the main points in a clear manner and be ready to answer questions from your classmates.
Additional Resources:

African Telecommunications Union (ATU): http://atu-uat.org/
infoDev, http://www.infodev.org

The International Association for the Wireless Telecommunications Industry (CTIA): http://www.ctia.org/media/index.cfm/AID/10319

IST-Africa repository of ICT and S&T Policies in Africa: http://www.ist-africa.org
 http://www.ist-africa.org/home/default.asp?page=paper-repository

ITU World Telecommunication Indicators: http://www.itu.int/ITU-D/ict/index.html

Learning Initiatives on Reforms for Network Economies, http://lirne.net/

Georgetown’s Communications Law Research Guide: http://www.ll.georgetown.edu/guides/communications.cfm

OECD, Internet Economy: http://www.oecd.org/topic/0,2686,en_2649_37441_1_1_1_1_37441,00.html

Open Net Initiative: http://opennet.net

Mobile Marketing Association: http://mmaglobal.com/main

National Cable and Telecommunications Association: http://www.ncta.com/


Journals of Interest:


Human-Computer Interaction, http://www.tandfonline.com/toc/hhci20/current


Information Development, http://idv.sagepub.com/

Information Technologies and International Development, http://itidjournal.org/itid

Information Technology for Development, http://itd.ist.unomaha.edu/itd/


Journal of Health Informatics in Developing Countries, http://www.jhidc.org/
The Information Society, http://www.indiana.edu/~disj/