



CONCEPT PAPER

# WirelessU.org Concept Paper

## WirelessU.org is:

- An open access repository of educational materials: All available for any person to download.
- A community—WirelessU connects people. Whether you are interested in learning about wireless technology, teaching a wireless training session, or holding a training event at a local venue, WirelessU will help you connect to the people who make all of this possible.
- A tool for educators: Distribute your training materials to your students—just upload & share the link. All of your revisions and translations are tracked, making it easy to find, share, and collaborate.

We are a group of dedicated professionals working towards a world-wide, people-centered, inclusive Information Society. Our goal is to make it easier for existing groups to offer wireless training. Please browse, download, comment and contribute. Each unit has been composed and presented by experts in teaching wireless networking.

## History and Concept:

For the past decade, several expert groups (including the APC, EsLaRed, the ICTP, Inveneo, IT+46, wire.less.dk, and others) have sponsored training sessions to teach low-cost wireless network building techniques to IT professionals from all over the world. These activities are creating a global social network of skilled professionals, as well as a large body of useful, practical information about jump-starting local telecommunications projects. These people, the projects they undertake, and the experiences they share have all become instrumental in creating effective local change in developing countries.

The combined efforts of these and other network training efforts currently reach 300 to 500 people per year, many of whom go on to design and implement wireless networking projects that solve their own telecommunications problems.

The goal of WirelessU is to increase the number of qualified, trained individuals to 5,000 or more per year. We are working towards this goal by providing a standardized and open approach to hands-on training, and providing universal access to our training materials and techniques.

WirelessU does not organize training sessions itself. We promote a common understanding of how such training programs may be offered by providing a template, curricula, and a list of instructors experienced in providing such training in the developing world. We have built a professional, continually updated curriculum created by internationally recognized experts in the field. We hope to socialize this concept and provide our template to organizations that wish to host a training session, as well as to organizations that might help fund such activities. The ultimate goal is to allow quality wireless training courses to be offered many more times, by different organizations in different places, while simultaneously drawing on and expanding our group of experienced trainers.



Lab in AIT, Thailand, 2008



Lab work at AfNOG, Cairo, 2009



“WNDW” Books

### **Pictures of past WirelessU Courses**

#### **Why Wireless (Wi-Fi)?**

Advances in wireless technology make it very attractive for extending the Internet—either across the street or to the next town. Wi-Fi is fast, can go long distances, and is very affordable. Best of all, anyone can learn to use wireless to extend existing internet into other areas and create their own infrastructure. *The signal starts with you!*

#### **Project Plans**

Organizing a technical training class is a somewhat involved project. The organizer must locate a facility, engage instructors, advertise for appropriate students, review applications, make local arrangements for transport and sometimes expenses, obtain PC's for the lab, and obtain specialized wireless tools. WirelessU.org has a template project plans to help organizers and donors understand what must be done to have a success.

#### **Curriculum**

WirelessU offers a 3-day Boot Camp, a 5-day and a 10-day course.

##### **Three-day Wireless Boot Camp**

The goal of the 3-day crash course is to help people understand that WiFi can go further, how to choose the right antenna, how to properly install WiFi equipment, and to understand how all of this fits into their existing network.

Topics include:

- Local case study, provided by a local instructor
- Antenna fundamentals
- Introduction to link budget
- Antenna lab
- Radio spectrum, wireless standards, and protocols
- TCP/IP fundamentals
- Bandwidth requirements for various applications
- APs and clients
- Wireless configuration lab

- Power over Ethernet, grounding, and lightning protection
- Outdoor installation
- Wireless Security
- Case study review

### **Five-day Course**

In the one-week course, the above topics are covered in greater depth. We also spend more time on advanced topics such as long distance WiFi and mesh networks. The following subjects are introduced:

- Mesh networking
- How to choose wireless networking equipment
- Long distance considerations
- dB math
- Network management and monitoring
- Site survey

### **Ten-day Course**

In the two-week course, the above topics are covered in even greater detail. We also introduce a group challenge, where teams are expected to cooperate to solve a real-world wireless problem. If logistics permit, we also introduce a field experiment to create a long-distance wireless link between buildings on campus. Additional topics can be tailored to fit the audience, and may include:

- Applied mesh networking exercises
- Wireless sensor networks
- Antenna modeling software
- DIY antenna designs
- Case studies (in collaboration with all participants)

### **2009 Accomplishments**

In 2009, with the support of The Internet Society ([www.isoc.org](http://www.isoc.org)), the Network Startup Resource Center ([www.nsrc.org](http://www.nsrc.org)), and [NetworktheWorld.org](http://NetworktheWorld.org), and many volunteer hours, WirelessU courses were given in Nepal, Papua-New Guinea, Columbia, and Thailand. Courses are planned for Benin and Nigeria.

### **Find out More**

More information is available at the web site, [www.wirelessu.org](http://www.wirelessu.org). A companion book is available on an open source basis, "Wireless Networking in the Developing World", available in print or free download in six languages (English, French, Spanish, Portuguese, Arabic, and Indonesian) at [www.wndw.net](http://www.wndw.net), which has now had over 2 million downloads.