

# Bring Virtual Learning to Life in Electrical Engineering

## Bring Virtual Learning to Life in Electrical Engineering

by Andrew G. Bell  
[abell118@ivytech.edu](mailto:abell118@ivytech.edu)  
(260) 481-2288

Oct 30, 2012  
STEMTech Conference  
Kansas City, Missouri

Ivy Tech Community College is Indiana's largest public postsecondary institution and the nation's largest singly accredited statewide community college system. Ivy Tech serves nearly 200,000 students annually and has campuses throughout Indiana.



Ivy Tech Community College offers a two year Associates of Science in Engineering Technology.

The Engineering Technology program started in Fort Wayne in 2011

Our students include both traditional and returning students



## The Need

Engineers today must know and use many software packages.

These software packages are complicated to use and may require higher end PCs to run on.

To support the need of educating engineers, colleges must provide a means for student to access the software and training student on how to use it.

## The Cost

PSPICE free but limited version for students

Multisim ~\$45 to download

LabVIEW is part of Multisim download

MATLAB ~ \$100 to download

Simulink is part of Matlab download

MathCad ~\$100 to download for perpetual license

Minitab - \$30 for 6 months or \$100 for perpetual license

ModelSIM free but limited version for students

Mathematica - \$140 Standard Edition to \$45 Semester Edition AutoCAD,  
SolidWorks, Micro-Cap, etc.

The Problem - for the student

Students must invest in software and maintain a PC which is powerful enough to run the software.

If your PC crashes you are in trouble, is it a hardware or software problem

If the software doesn't load correctly you maybe in trouble with the PC you are using

Files are vulnerable to loss and corruption

Software you own may not match the version being used in class

What about tech support?

The Problem - for the college

IT departments may become overloaded with the installation and support of engineering software

How do they test it if they don't know how to run it?

Can the school's computer network support the software licensing needs?

Software must be loaded on each PC that will be used by the engineering software.

Faculty may not have admin rights (or want the rights) to support the software updates

Software updates may not occur fast enough to support classroom use

Can the classroom and lab computers support the engineering software?

## A Solution

Provide a software platform which can be used in both the classroom and student PCs.

New platform should not tax school or student PCs.

Storage of working files for student

Storage of tutorial files for each course

Easy file uploads and downloads

Assessments to facilitate student learning

Tutorials on how to use the software

Point of need information



### The Experiment

Ivy Tech Community College entered into an agreement with Toolwire to develop a virtual circuit simulation environment based on National Instrument's Multisim for students in EECT 111 (Introduction to Circuit Analysis).

Ivy Tech students could remote into Toolwire from any computer at Ivy Tech.

The new environment allowed for the integration of lectures material, tutorials and assessments within a virtual environment with quick and easy access to Multisim without the need for local installs.

### The Results

Design entry and simulation time exhibits no noticeable lag time.

Many IT problems were resolved quickly because Toolwire took ownership of the problem

Cost per student was \$50 each.

Uploaded web page could easily be used to link to high volume data files and videos. No need to upload everything into the Remote Desktop environment.

Remote PC hard drive were not an issue but elimination of large sim files will help to minimize hard drive size

## The Results

Need more capability to transfer (upload and download) files

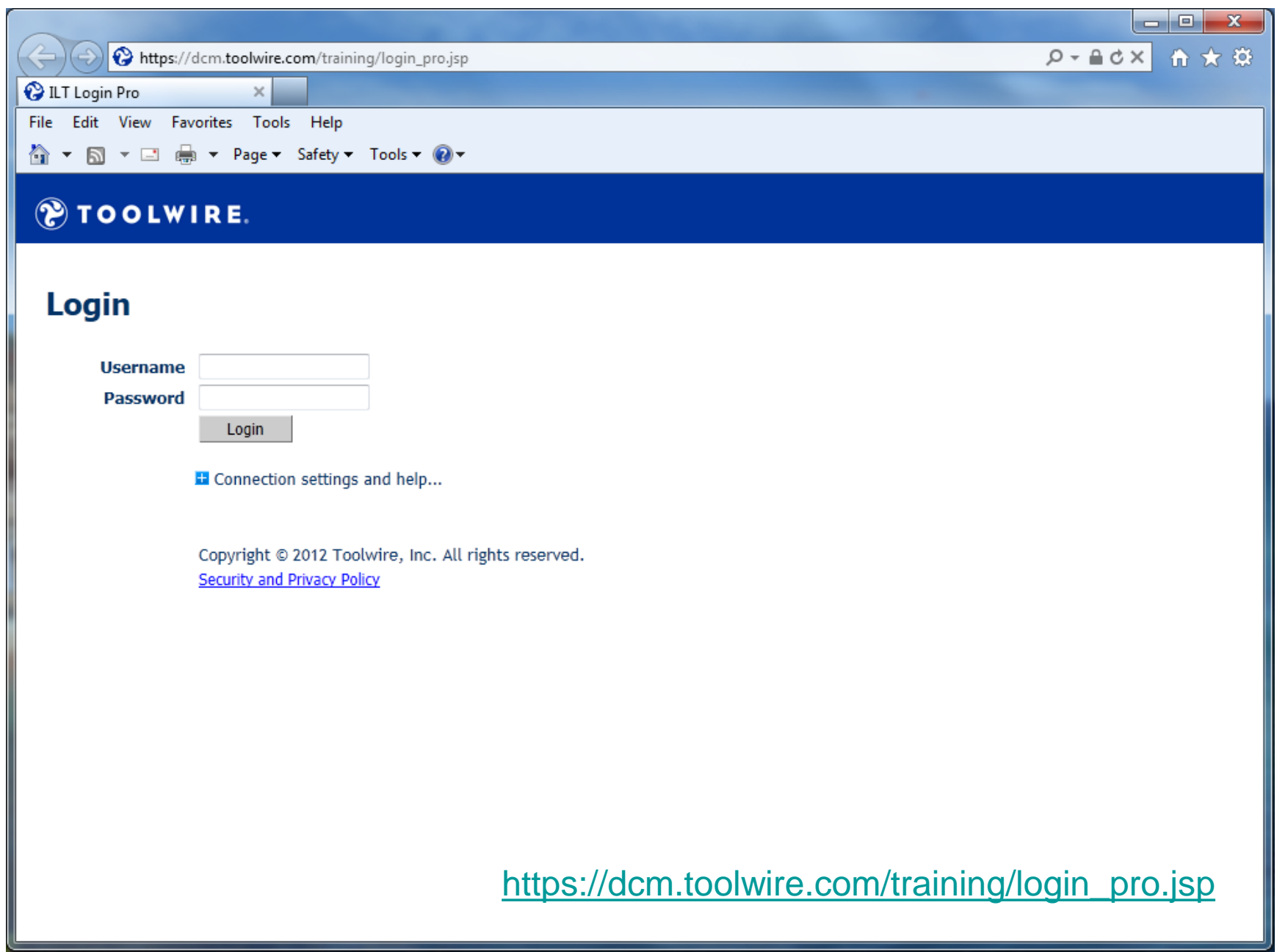
Need ability to update course info as needed

Some IT problems were caused by students lacking admin privileges. This would not be an issue if the student uses their own PCs.

Need to work with software vendors to ensure best value for students and college.

### The Future

Ivy Tech Community College is in the process of entering another agreement with Toolwire to develop a virtual circuit design and analysis environment based on the use of Multisim, PSPICE, ExpressPCB and other engineering software.



https://dcm.toolwire.com/training/login\_pro.jsp

ILT Login Pro

File Edit View Favorites Tools Help

Page Safety Tools

**TOOLWIRE.**

## Login

Username

Password

Login

+ Connection settings and help...

Copyright © 2012 Toolwire, Inc. All rights reserved.  
[Security and Privacy Policy](#)

[https://dcm.toolwire.com/training/login\\_pro.jsp](https://dcm.toolwire.com/training/login_pro.jsp)

