Department of Technology
Fall 2006

EET 395
SPECIAL TOPICS IN CET/CEN – WEB AND APPLICATION SERVICES

Instructor:
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Class schedule:
Section: 001, CRN: 14953; TR: 6 - 8 pm, in Room 407/400

Office Hours:
MTWR: 10 - 11 am, 4:30 - 6 pm. If my office door is open at other times I will most likely be available for discussion. Come right in.

Credit hours:
3

Prerequisite:
Instructor approval

COURSE DESCRIPTION:
[Emerging technologies in the area of Computer Electronics Technology (CET) and Computer Electronic Networking (CEN): networking system administration, microcomputers, electronics, hardware, network operating systems, scripting, security, computer industry standard certifications, will be covered in a combination of lecture, demonstration and laboratory.]

Open source software for use in small business. Installing, configuring, and troubleshooting different versions of Linux. Implementation and administration of server side applications involving web services, databases, file transfer, and email. Scripting languages and extracting information from databases. This course has a project component and students are encouraged to pursue their ideas related to small business network applications running on Linux, Windows, Macintosh or Novell systems.

TEXTBOOK:

Open Source Solutions For Small Business Problems. Author – John Locke; Publisher – Charles River Media; ISBN – 1584503203

References:

1. **Linux.** 1st edition; Author – Patrick Regan; Publisher – Prentice Hall; ISBN – 0130984590
2. **PHP and MySQL Web Development.** 3rd edition; Author – Luke Welling, Laura Thomson; Publisher – Sams; ISBN – 0672326728
3. Free online books at EKU libraries: http://www.netlibrary.com/

COURSE OBJECTIVES:

1. Comparing open source and proprietary software
2. Installing and configuring Linux.
3. Running Linux desktop and client-server applications
4. Managing users and file systems in Linux using command-line and graphical utilities
5. Installing, configuring, and troubleshooting web servers
6. Installing, configuring, managing and troubleshooting databases
7. Installing, configuring and programming server-side scripting languages
8. Integrating databases and web functionality using server-side scripting
9. Ensuring secure communications over local and remote computer networks
10. Researching open source software for use in small business

COURSE OUTLINE:

1. Software for small business
   i. Proprietary software
   ii. Open source software
   iii. GNU General Public License (GPL)

2. Introduction to Linux
   i. Network Operating Systems (NOSs)
   ii. Linux architecture – kernel, utility programs and systems configuration files
   iii. Linux kernel, general features, interfaces, documentation, text editors
   iv. HOWTO documents
   v. Virtual terminals
   vi. Daemons – starting, stopping, restarting, activating, deactivating

3. Installing Linux
   i. Hardware requirements for installing Linux
   ii. Downloading Linux
   iii. Packages and compressed files
   iv. Partitioning hard drives
   v. Installing, verifying and troubleshooting Linux installations

4. Shells and X Windows
    i. Using the Bourne shell – common commands
    ii. Directory structure under Linux
    iii. Environment variables
    iv. Desktop environment, windows and display managers

5. Linux applications
    i. OpenOffice
    ii. Viewing postscript and PDF files
    iii. Graphics manipulation
    iv. Web browsers
    v. Open source utility software

6. Networking, file and printer sharing in Linux
    i. Network cards
    ii. TCP/IP addressing, subnetting, address resolution
    iii. Network configuration files
    iv. File and printer sharing
    v. Connecting Linux systems with those running Windows and Mac OS X

7. Managing Users, Disk and File systems
    i. Usernames and passwords
    ii. Root account
    iii. Configuring – modifying, deleting, default settings for users
    iv. Groups – administration, authentication
    v. File and system security – account restriction, detecting intruders

8. Shell scripts
    i. Creating shell scripts
    ii. Syntax, operators, and functions
    iii. Executing and troubleshooting shell scripts

9. Web services
    i. Creating web pages
    ii. Installation and configuration of the Apache web server
    iii. Troubleshooting web servers
    iv. FTP servers
    v. Remote access – network security, firewalls, proxy servers, simple network
    vi. Email – simple mail transfer protocol, setting up email services
    vii. Secure network access

10. Databases – MySQL
    i. Principles of database design
    ii. Normalization of tables
    iii. Installation and configuration of MySQL
    iv. Troubleshooting MySQL

11. SQL commands
    i. Data types
    ii. Table creation, deletion, updating
    iii. Inserting and retrieving data form tables
    iv. Functions
    v. Transactions

12. Server-side scripting – Perl
    i. Installing Perl
    ii. Perl and PHP
    iii. Creating Perl scripts
    iv. Syntax, operators, and functions
    v. Executing and troubleshooting Perl scripts
    vi. Adding forms to web pages
    vii. Using Perl modules and Common Gateway Interface (CGI) for collecting user data using web forms

13. Server-side scripting – PHP
    i. Installing and configuring PHP
    ii. Using PHP with HTML
    iii. Data types and variables
    iv. Operators and constants
    v. Flow control – switching statements and loops
    vi. Functions
    vii. Strings
    viii. Arrays
    ix. Objects

14. PHP programming
    i. Files
    ii. Images
    iii. Forms
    iv. Cookies

15. Integrating web servers, databases and scripting
    i. Sample projects requiring web and database interactivity
    ii. Open-source templates for web based projects – blogs, mailing lists
    iii. Secure web services

COURSE REQUIREMENTS:

1. Complete all class assignments and submit these on the prescribed dates.
2. Complete assigned laboratory work and class project.
3. Complete the assessment covering material from the labs, text and online sources.
4. Maintain a 3-ring binder or folder for organizing class materials.

EVALUATION:

Each student will be evaluated as follows:

- Assessments (25%) – 2 mid-term assessments (with written and hands-on portions)
- Lab assignments (30%) – between 10-15 lab assignments
- Open source design project implementation and presentation (30%)
- Weekly paragraphs (15%) – related to topic of the week

You may rework and resubmit the assessments, assignments, weekly paragraphs or labs for limited partial credit.

Design project/Research paper and presentation: Projects related to open-source software such as: database access through web servers running on Linux, for example an alumni tracking website for CEN graduates; establishing networking services across multiple operating systems including the Apple Mac OS X and different versions of Windows; modifying existing Linux kernel code and creating new distributions for enhanced networking capabilities; Implementation of your designs is strongly encouraged. You may work in teams of 2-3 students.

An initial group project proposal is to be submitted for instructor approval. A group presentation of your work is required, and a video clip showing your project working would be very much preferred. Your final presentations will be displayed via the class website.

An individually written detailed project report, approximately 10 pages in length including appropriate bibliographical references [in American Psychological Association (APA) format http://nutsandbolts.washcoll.edu/apa.html], is required as well. Step-by-step procedures ('HOWTO' documents) needed for building the complete project, are to be included in the appendix of your project. These can also be published on open-source project websites.

Weekly Paragraphs: One paragraph related to the topic being discussed in class is to be submitted on a weekly basis. It should contain a summary of a recent (2006 onwards) computer or networking magazine, conference paper, or web site link related to open source software. Complete references for the original article, including when it was retrieved for web sources, and preferably a copy of the article itself should be provided. Use bibliographical references in American Psychological Association (APA) format. Students are invited to discuss their paragraphs in class.

Attendance Policy:

After the second unexcused absence, each unexcused absence will cause one percent deduction in the overall percentage. Five (5) and seven (7) unexcused absences will result in one letter grade lower each. Your grade will be an automatic F if you have more than seven (7) unexcused absences. A Makeup exam will be permitted only if you had sought and received my approval prior to the absence which caused you to miss the related exam.

Grades:

100-90%	= A	69-60%	= D
89-80%	= B	Below 60%	= F
79-70%	= C		

Mid-term grades will be made available to students by Friday, October 6, 2006.

STATEMENT OF DISABILITIY:
ADA

If you are registered with the Office of Services for Individuals with Disabilities, please make an appointment with the course instructor to discuss any academic accommodations you need. If you need academic accommodations and are not registered with the Office of Services for Individuals with Disabilities, please contact the office on the third floor of the Student Services Building, by email at disabilities@eku.edu or by telephone at (859) 622-2933 V/TDD. Upon individual request, this syllabus can be made available in alternative forms.

☹ The work you do in the laboratory, and the grade you earn, should reflect your personal abilities, and accomplishments. Individual homework and lab reports are required from each student. I encourage you to discuss your assignments with other students. However any work you submit must be your own.

☺ Any suggestions leading to improvements in the content or presentation of the course, especially in the laboratory work, are most welcome.