ROOSEVELT UNIVERSITY
COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF COMPUTER SCIENCE AND
TELECOMMUNICATIONS

CST 318 – Introduction to Unix

Syllabus

Instructor: ERIC G. ERKOWITZ

Office hours:
In Person: Monday and Thursday 4:00 – 6:00 PM  Schaumburg Campus Room 631
Online: always via e-mail and moderated discussion groups. Other methods by arrangement.

E-mail:
The following instructions are mandatory for sending e-mail. Failure to comply may cause your email message to be lost.
My e-mail address is: eberkowi@roosevelt.edu
When sending a message you must:
• use a relevant subject line.
• put your FULL NAME and Unix username in the body of the e-mail.
• send a complete and concise message.
• if your message is about an error message, send the full text of the message.
• When explaining a problem please not tell me just that “XXXX does not work.” You must explain:
  o What you wanted (expected) it to do that it is not doing.
  o What is actually does whether or not this is what you wanted.
  o Any feedback provided by the computer system including all error messages.
o Anything else that might help but the items listed above are a minimum.
Computer access:

Students will be given accounts on one or more CST servers, and the CST
Network Users Policy. The CST Network Users Policy will be posted with the
course documents on the Blackboard site for this course. You are expected to read it. Use of any CST computers implies your agreement with the terms of the policy.

**Plink VNC (and Putty)**

The course utilizes special software that allows students to access the CST Unix server with a full Graphic User Interface, over a broadband Internet connection. This is done using the programs plink and Vnc as explained in week one of the course. In the rare instances where students have been unable to connect graphically to the server and attempts to diagnose and cure the problem have failed, it is also possible to use standard Terminal access to the server using the putty program.

If you need or want to use plain Terminal access please contact the me for instructions.

Comments: All software required for this course is Open Source and no-cost software. It may be downloaded off the Internet and links to do so are shown in the lesson for week one. The lesson for week one also includes detailed instructions as well as instructions for Mac OS X users.

The beauty of the software we are using is that:

1. The software saves its state. When you disconnect your GUI session the server remembers exactly the way it was. Unless the server crashes or fails in some other way, the way you left the system when you disconnect is exactly the way you will find it when you log back on.
2. You can log on from anywhere with a broadband connection to the Internet. Please note that due to rigid security at many places of business you may be unable to connect from work unless you make special arrangements to do so with your IT staff.
3. On-line help from the instructor can be real-time and fully interactive. It is possible for you and me to both log into your GUI session and interact with the same programs at the same time. Thus, if you are having difficulties, it is possible for me to see what is going wrong and to demonstrate the correct approach to fixing it no matter where you are or where I am. As long as we can both access the server at the same time we can interact via a single GUI we both see.
4. It is possible to use GUI based editors, cut and paste, and other features of a modern OS even over a remote link.
The software does take some time to get used to it, and ample time is provided in the schedule as well as detailed online instructions. Once you do get used to the software, I believe you will find it enjoyable to use. Of course I am always available to provide help.

An important note to users of wireless networking.

Wireless is great – Sometimes! It means one can surf the Web and be on a network without being tethered to a wall outlet. It does have a down side. It is not 100% reliable. This is not a problem for surfing the Web where each request for a page is an isolated event. If you connection lapses momentarily between requests for pages you probably don’t even notice it. If it lapses during a request you see your browser hang and you press the reload button to issue a new request.

This behavior is however a problem for remote server access. The communications between the server and your home computer must be 100% reliable with no lapses. Even the shortest interruption can sever the link and cause the software to close with an error message forcing you to log on over and over again. If this happens to you, you may try the following:

1. Set your equipment to Wireless-B mode even if you have one of the new superfast systems. Wireless-B is actually far more stable and immune to interference than later versions.
2. You may need to use a regular Ethernet cable connection when using the software for this class.

Course Description:

The course is intended to help familiarize students with the use of modern Unix based operating systems. A more detailed description of the course can be found in the course documents for week 1.

Format:

The class will be a combination of (written) lectures, reading assignments, guided study, and homework/project preparation. Homework and reading will be assigned each week. Students are required to expand upon what they learn in class, to ask questions, and to pursue demonstrate an ability to use the skills they acquire during the course for independent solving of problems. When problems or questions arise during the course students are expected to
demonstrate an ability to use the available documentation to find answers. Students are always welcome to send questions or concerns to the instructor but when doing so will be expected to include with the question an explanation of the steps the student took to try to solve the problem independently. The instructor in turn will work with the student to: A) resolve the problem at issue and B) help the student enhance his or her independent problem solving skills.

Quizzes may be given periodically to assess a student's assimilation of the course material.

Each student will be submitting several homework assignments during the semester

Grading:

Homework: 30%, Quizzes: 15%, Midterm: 25%, Final Exam 30%

Please note that the final exam may take the form of a formal test or a -home assignment/project.

Instructions for Submission of Homework

Homework submission:

New this semester: Written homework must be turned in using the ‘turnitin’ system on blackboard. Homework will not be accepted via other means. Homework must be submitted cleanly, neatly and on-time. I must insist that assignments be submitted by any stated deadline even if the work is incomplete! Partial work will receive partial credit but late work will not be accepted. You may request permission to complete the assignment and resubmit it but you must send what you can on or before the deadline. This may sound harsh, but particularly in an on-line environment where direct contact is limited, continuous feedback is essential to the courses success. Why? Because, if students in the class are unable to complete an assignment the instructor needs to know that. The instructor can not get any information from a lack of submissions except to conclude that the work is not getting done. On the other hand, if several students submit partial assignments the instructor, when seeing this, can learn that he needs to provide additional instruction or support in the areas that proved difficult.
Homework may also take the form of an on-line assessment. If such an assessment exists for the current week’s lesson, please follow any on-line instructions and complete the assessment by the last business day of the appropriate week.

During the semester the form of homework submission will vary. If you are asked to answer questions from the textbook you need to submit homework in the following way. Again, failure to follow instructions can have unfortunate results and prevent you from receiving credit for work you have done, so please review all instructions carefully.

Written assignments can be sent to the instructor as:

1. Microsoft Word document
2. Rich Text Format (RTF)
3. Plain text

Students are responsible for ensuring that any files sent to the instructor are virus free. Infected files will receive a failing grade.

Files sent to the instructor must be less than 1 Megabyte in size. Your file must contain the following information:

1. Your full name
2. The assignment you are doing and the week with which it is associated in the online course sequence.

Later in the semester you may be asked to create files on the lambda computer. You must use the filename and directory structure specified in the assignment.

**Attendance:**

This is an on-line course and regular attendance rules used for on-site courses do not apply. Still students are expected to keep up with the week-by-week plan for the course and to submit work on time.

**Deadlines and Due Dates:**

Students are responsible for making sure materials are submitted on or before any due dates. Late work is not accepted. Students should submit the completed portion of any assignment by the stated due date. If you cannot be in class the day an assignment is due you must submit your work at an earlier time.
Academic Honesty:

Students are required to familiarize themselves with Roosevelt University's policies regarding academic honesty. Violations will result in an automatic failing grade and formal disciplinary action.

Students are expected to apply themselves and their previous experience and knowledge in this class. A student who does this will produce projects and homework that are uniquely his/hers and unlike those of any previous or current students. While students are encouraged to help one another, collaboration on assignments to be submitted for grading is prohibited and will be considered a violation of academic integrity unless the students involved have requested and received prior consent from the instructor.

Reading Instructions:

If you have read this far in the syllabus you are doing quite well. Unfortunately, each semester, several students submit work that is of lower quality than that which they are capable of submitting for no other reason that the fact that they did not completely read all of the instructions including any hints and guidelines at the end. No matter how complete, true, and explanatory an answer is, it only gets credit if it actually responds directly and completely to the question that was asked. Please! In all homework, assignments and exams, read all instructions and only then begin to work. After completing your work re-read the instructions to ensure that you have done all that was asked and in the manner specified. Rewrite the questions and instructions for yourself as a check-sheet and check off each section if you believe this will help.

Schedule

Free lesson:  *This lesson can be completed at any point during the course. Those interested in setting up their own Unix computers might like to complete it at the beginning of the semester. Others may want to leave it to be completed at the end of the course in week 13. The choice is yours.*

Topics:
- Other Desktop Operating Systems

Homework:
- List 5 ways Unix excels over Windows.
- List 5 ways Windows excels over Unix.

Reading:
- On-line notes
Week 1:
Topics:
  Introduction to the class, the instructor and the lambda computer system. Learning to log on and use the GUI. First sample of Unix commands.
Homework:
  Please complete the on-line assessment
Reading:
  Unix: The Textbook – chapters 1,2

Week 2:
Topics:
  Introduction to the Unix shell and some standard Unix utilities. Getting on-line documentation using man
Homework:
  Please see the online assignment sheet
Reading:
  Unix: The Textbook – chapters 0,3,4
  Please skip the following sections: 0.5.2, 0.5.3

Week 3:
Topics:
  Working with files and their contents: cat, more, less, grep
Homework:
  Please see the online assignment sheet
Reading:
  Unix: The Textbook – chapters 7,9
  Please skip the section 9.8

Week 4:
Topics:
  Editing text files: pico, vi and emacs
  Console editors vs. GUI editors
Homework:
  Please see the online assignment sheet
Reading:
  Chapter 5

Week 5:
Topics:
  The Unix file system: security, access control, users, groups, search and processing
Homework:

Please see the online assignment sheet

Reading:

Unix: The Textbook – chapters 8, 10
Please skip sections 10.8 and 10.9

Week 6:
Topics:
Redirection and Pipes: standard output, standard input, standard error

Homework:

Please see the online assignment sheet

Reading:

Unix: The Textbook – chapters 12
Please skip section 12.13

Week 7:
Topics:
Sharing via file links: hard links, soft links, inodes

Homework:

Please see the online assignment sheet

Reading:

Unix: The Textbook – chapter 11

Week 8:

Midterm Exam

Week 9:
Topics:
Jobs and job control, processes, process IDs, foreground and background execution

Homework:

Please see the online assignment sheet

Reading:

Unix: The Textbook – chapters 13

Week 10:
Topics:
Introduction to (Bash) Shell Scripting: basic commands, blocks, iterative control structures

Homework:

Please see the online assignment sheet

Reading:

Unix: The Textbook – chapters 15
Please skip the following sections: 4.3.3, 4.3.5
### Week 11:
**Topics:**
- Introduction to Programming with Perl: the pro’s and con’s of using Perl, using command-line arguments in Perl

**Homework:**
After completing the on-line reading do the following:
- Write a Perl Scripts to do the following:
  1. Print the average of the command line arguments.
  2. Print the command line arguments in ascending numeric order.
  3. Print the command line arguments in descending alphabetic order.
  4. Print the string concatenation of all command line arguments.

**Reading:**
- Introduction to Perl Handout

### Week 12:
**Topics:**
- File processing in Perl: reading files, writing files, handling end-of-line

**Homework:**
After Completing the on-line reading do the following:
- Write a grep utility in Perl.

**Reading:**
- Introduction to Perl Handout

<table>
<thead>
<tr>
<th><strong>Topics</strong></th>
<th><strong>Chapters</strong></th>
<th><strong>Assignment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction</td>
<td>1,2</td>
<td>On-line assessment</td>
</tr>
<tr>
<td>2 Shell and standard Utilities – man</td>
<td>0,3,4</td>
<td>See the detailed course description above</td>
</tr>
<tr>
<td>3 Files cat, more, less, grep</td>
<td>7,9</td>
<td></td>
</tr>
<tr>
<td>4 Editing files with pico, vi, emacs</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5 The file system</td>
<td>8,10</td>
<td></td>
</tr>
<tr>
<td>6 redirection, pipes</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>7 Sharing via Linking</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>8 Midterm examination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Jobs and job control</td>
<td>13</td>
<td>See the detailed course description above</td>
</tr>
<tr>
<td>10 Introduction to scripting</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>11 Introduction to Perl:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perl Handout
<table>
<thead>
<tr>
<th>Syntax and command line</th>
<th>Perl Handout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perl file processing</td>
<td></td>
</tr>
<tr>
<td>Free Lesson: Other</td>
<td></td>
</tr>
<tr>
<td>Desktop OS’s</td>
<td></td>
</tr>
<tr>
<td>14 Final Exam</td>
<td></td>
</tr>
</tbody>
</table>

**Additional References:**

Unix Guru’s Beginners Site:  
Unix Review  
http://www.unixreview.com/  
SSC's Linux Journal  
http://www.ssc.com/lj/  
SSC's The Linux Gazette  
http://www.ssc.com/lg/  
IT World  
http://www.sun.com/sunworldonline/