

The University of Texas at Tyler  
Bachelor of Science in Computer Science

## Syllabus

<b>Course Number:</b>	COSC 4327
<b>Course Title:</b>	UNIX Shell Programming
<b>Course Description:</b>	Introduction to programming in the UNIX shell; directory structure and manipulating files, built-in functions, control structures, utilities, and sublanguages
<b>Pre-requisite:</b>	COSC 2336
<b>Credits:</b>	3
<b>Text:</b>	Sumitabha Das, <i>Your UNIX: The Ultimate Guide</i> , McGraw-Hill, 2001.
<b>Languages Used: (if applicable)</b>	Perl, C/C++
<b>Topics:</b>	<ol style="list-style-type: none"> <li>1. Introduction to UNIX</li> <li>2. General purpose utilities</li> <li>3. UNIX editors: vi/vim and emacs</li> <li>4. UNIX file system and file attributes</li> <li>5. The shell</li> <li>6. Simple filters</li> <li>7. The process</li> <li>8. TCP/IP Networking Tools</li> <li>9. The X Window System</li> <li>10. Filters using regular expressions</li> <li>11. Customizing the environment</li> <li>12. Programming in C/C++ in UNIX environment</li> <li>13. Shell programming</li> <li>14. Perl</li> <li>15. System and network administration</li> </ol>
<b>Additional Materials:</b>	

<b>Evaluation Method: (only items in dark print apply)</b>	
<b>1. Examination/Quiz</b>	<b>2. Homework</b>
3. Paper/Report	<b>4. Computer Program</b>
5. Project	6. Presentation
<b>7. Class Participation</b>	8. Peer Review

**Course Objectives<sup>1</sup>: By the end of this course students are expected to:**

1. Understand the concepts and features that characterize UNIX [1,2].
2. Understand general features of UNIX commands [1,2].

3. Distinguish between internal and external commands [1,2].
4. Break up a command into arguments and options [1,2].
5. Know how to use the man command and understand the organization of the documentation, especially the way the syntax is explained [1,2,7].
6. Know general purpose utilities in UNIX systems (passwd, who, w, tty, stty, script, uname, date, cal, calendar, bc) [1,2,7].
7. Be able to create and edit files using vi/vim or emacs [1,2,4,7].
8. Understand UNIX file system and know how elementary file and directory manipulation commands (pwd, cd, mkdir, rmdir, cp, rm, mv, cat, lp, gzip, df, du) [1,2,7].
9. Understand file attributes and know commands to list or change them (ls, chmod, umask, chown, chgrp, touch, find) [1,2,7].
10. Understand hard and soft links in UNIX file systems [1,2,7].
11. Understand the concept of UNIX shell [1,2].
12. Understand the meaning of wild-card characters in UNIX commands [1,2].
13. Understand the difference between single, double, and back quotes in a UNIX command [1,2].
14. Understand streams and be able to redirect standard input/output/error stream to a file [1,2,7].
15. Be able to set up a pipeline for connecting two or more commands [1,2,7].
16. Use command substitution to embed commands in command lines of other commands [1,2,7].
17. Understand the properties of shell and environmental variables and be able to use both types of variables [1,2,7].
18. Be able to use simple filters of the system (commands more, od, pr, head, tail, cut, paste, sort, uniq, tr, cmp, diff, comm, nl, spell, dos2unix, unix2dos) [1,2,4,7].
19. Understand the concept of a process and the mechanism of process creation [1,2].
20. Be able to view process attributes (command ps) [1,2,7].
21. Be able to run jobs in the background with & and nohup, suspend jobs and move them between foreground and background, kill a process [1,2,7].
22. Be able to make comparative estimates of the efficiency of programs (command time) [1,2].
23. Be able to use TCP/IP networking tools (telnet, rlogin, ftp, rcp, rsh, talk, finger) [1,2,7].
24. Be able to use X Window system [1,2,7].
25. Understand the xterm command and its options [1,2,7].
26. Be able to use e-mail in the UNIX system [1,2,7].
27. Understand regular expressions in UNIX and use them in command grep [1,2,4,7].
28. Understand the general environment-related features of popular UNIX shells and be able to customize user environment in their favorite shell by configuring the startup files [1,2,7].
29. Be able to create and execute simple shell scripts [1,2,4,7].
30. Be able to create and execute simple programs in perl [1,2,4,7].
31. Be able to create and execute in their favorite shell or perl advanced scripts, including if and if-else statements, case statements, loops, using positional parameters, and reading user input interactively [1,2,4,7].

32. Be able to use a C or C++ compiler under UNIX system [1,2,4,7].
33. Understand the structure of a makefile [1,2,4,7].
34. Be able to describe general duties of UNIX system administrator [1,2,7].
<sup>1</sup> Numbers in bracket refer to method(s) used to evaluate the course objective.

<b>Relationship to Program Outcomes: (only items in dark print apply )<sup>2</sup></b> <b>This course supports the following Computer Science Program Outcomes, which state that our students at the time of graduation are expected to:</b>
1. Posses knowledge of the fundamentals of mathematics, science, and technology.
<b>2. Be able to use modern computational tools and techniques in the practice of computer science. [14,15,18,22,23,24,25,27,28,29,30,31,32,33]</b>
3. Be able to develop logically sound and efficient algorithms.
<b>4. Be prepared to implement algorithms in multiple programming languages, on multiple hardware platforms, and in multiple operating system environments. [29,30,31,32,33]</b>
5. Be able to perform analysis, design, implementation, testing, and maintenance of computer-based systems, stressing software engineering principles.
6. Be prepared to seek continuing professional development, graduate studies, or professional certifications related to computer science.
7. Demonstrate effective written, visual and oral communication skills.
8. Posses an educational background to understand the global context in which computer science is practiced, including: <ul style="list-style-type: none"> <li>a. Knowledge of contemporary issues related to computer science;</li> <li>b. The impact of computers on society;</li> <li>c. The role of ethics in the practice of computer science.</li> </ul>
9. Be able to contribute effectively as members of a project development team.
10. Recognize the need to pursue continued learning throughout their professional careers.
<sup>2</sup> Numbers in brackets refer to course objective(s) that address the Program Outcome.

Prepared by: Artur Mikitiuk	Date: 03/31/05
Modified by:	Revised: