

COURSE DESCRIPTION

Department and Course Number	CS 345	Course Coordinator	Jiang Guo
Course Title	Unix and Shell Programming	Total Credits	4

Current Catalog Description:

A theoretical and practical study of the UNIX operating system and shell programming. Topics: Shell commands and utilities, UNIX file system, UNIX shells, UNIX graphical user interfaces, and shell programming

Textbook:

Tansley, David,. *Linux and Unix Shell programming*, Addison Wesley, 2000.
Deitel, Deitel, Nieto, McPhie,. *Perl How To Program*, Prentice Hall, 2003.

References:

None.

Course Goals:

At the end of the course, students are able to:

- Write shell scripts effectively.
- Create scripts to automate common tasks in Unix system, and to guard against malicious intents against the Unix operating system.
- Create reports about users' activities as well as about system usage.

These course goals contribute to the success of **Student Learning Outcomes 1.b, 1.f, 2, 5, and 6**.

Prerequisites by Topic:

Object Oriented Programming with Data Structures.

Major Topics Covered in the Course:

- Unix commands: command options
- Advanced VI commands.
- Unix commands: piping and redirections.
- Unix power utilities: sed and awk.
- Introduction to Unix shell programming.
- Using shell scripts to automate common tasks.
- Using shell scripts to generate report and online report.

- Introduction to Perl.
- Creating report and online report using Perl cgi and Mysql queries.

Laboratory Projects (specify number of weeks on each):

For each topic taught, the students have to complete a project related to that topic.

Topics include but not limited to:

- Apply Unix commands to solve common problems: 1.5 weeks.
- Apply Unix commands, piping and redirections to solve a common problem: 1.5 weeks.
- Apply sed and awk to solve common problems and generate report: 1.5 weeks.
- Creating shell scripts to automate common tasks: 1.5 weeks.
- Creating shell scripts to generate report and online report: 1.5 weeks.
- Generating perl cgi scripts to generate report and online report: 1.5 weeks.

Estimate Curriculum Category Content (Quarter Hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms		.25	Data Structures		.25
Software Design		0.5	Prog. Languages		2.0
Comp. Arch.		1.0			

Oral and Written Communications:

Written documentation of software built in labs and homework assignments.

Social and Ethical Issues:

No significant component

Theoretical Content:

- Unix operating system and its environment. (3-4 weeks)
- Web report modeling using Apache, MySQL, Unix shell and Perl. (5 weeks)

Problem Analysis:

In this course, students learn how to solve problems related to the Unix operating system, Apache web server, and MySQL database server.

Students learn how to generate shell scripts to automate common tasks, such as creating report for users' activities.

Students also learn how to creatively generate a script to solve a problem, such as to automatically query a database without repeatedly writing the same query.

Students learn online reporting and drill down technique, as well as how to implement security on a server.

Solution Design:

Students create solutions for problems that arise in every-day computer operations. They also create web reports which allow users to go online to check on the status of certain operations.