

ERIE COMMUNITY COLLEGE
COURSE OUTLINE

A. COURSE NUMBER
AND TITLE:

DA155 Operating Systems and Shell Scripting

B. CURRICULUM: Information Technology

C. CATALOG
DESCRIPTION

An overview of the major Operating Systems(DOS/Windows; UNIX/Linux) used in personal computers is presented. Introduction to how the various operating systems are designed, the process of booting up, device recognition and how the kernel works. The fundamentals of writing shell scripts within the various Operating Systems is also presented.

Prerequisite: CS 121 or DA 150 or programming knowledge or permission of the instructor. (N, C)

D. DURATION OF
INSTRUCTIONAL
PERIOD:

Two hundred and fifty minutes per week for fifteen weeks
(150 minutes lecture, 100 minutes lab).

E. ACADEMIC

CREDIT HOURS: (3,2,4)

F. SUGGESTED TEXT/COURSE MATERIALS:

Classic Shell Scripting Arnold Robbins & Nelson
Beebe, OReilly Publishers, 2005 ISBN 0596005954

G. COURSE OUTCOMES:

Upon completion of this of this course, the student will be able to:

1. Name and describe the various Operating Systems.
2. Demonstrate proficiency with the Unix/Command Window type command line interface (CLI)
3. Run programs in foreground and background
4. Use file manipulation commands
5. Use system commands
6. Work with processes running in memory
7. Manipulate the stdin, stdout and stderr streams
8. Use I/O redirection
9. Use pipelining
10. Customize a user's environment
11. Create regular expressions for use in scripts
12. Manipulate environment variables
13. Create shell scripts containing conditionals, loops and eval commands
14. Use arguments in shell scripts
15. Create Windows Power Shell Objects
16. Write shell scripts to perform routine tasks.
17. TECHNOLOGY OBJECTIVES:
 - a. Use a computer to develop programs.
 - b. Use the Windows and UNIX/Linux operating environment effectively

H. Program Competencies:

Upon graduation with an Associate in Applied
Science degree in Information Technology, the
graduate will be able to:

1. Demonstrate knowledge of a broad business and real world perspective of information technology.
2. Demonstrate analytical and critical thinking skills.
3. Demonstrate the ability to apply analytical and logical thinking to gathering and analyzing information, designing and testing solutions to problems, and formulating plans.
4. Demonstrate the ability to visualize and articulate complex problems and concepts.
5. Demonstrate the ability to gather, analyze and organize data using a logical and systematic process.
6. Demonstrate the ability to select, implement and evaluate appropriate problem solving techniques and tools.
7. Demonstrate the ability to effectively adapt problem solving techniques to specific situations.
8. Use and apply current technical concepts and practices in the core information technologies.
9. Identify and evaluate current and emerging technologies and assess their applicability to address the users' needs.
10. Analyze the impact of technology on individuals, organizations and society, including ethical, legal and policy issues.
11. Demonstrate an understanding of best practices, standards and their application.
12. Demonstrate independent critical thinking and problem solving skills.
13. Communicate effectively and efficiently with clients, users and peers both verbally and in writing, using appropriate terminology.
14. Demonstrate the ability to present and discuss how computer systems impact the operation and management of business and society.
15. Demonstrate the ability to discuss the impact of information technology on society and the workplace.

CERTIFICATE COMPETENCIES:

Upon completion of the course, students will:

1. Be conversant with multiple digital devices including, but not limited to; computers, personal digital assistants, cameras, cell phones, ipods, removable flash media
2. Be knowledgeable about the physical handling of digital devices
3. Be able to create understandable and accurate reports.

I. SUNY General Education
Ten Knowledge Areas:

Not Applicable

J. ECC Graduate Learning

Outcomes (GLO): 1. Communicate effectively.
Related Course Outcomes:

1, 17

2. Read and think critically.

Related Course Outcomes:

1 to 17

3. Demonstrate adequate preparation for a career or continuing education.

Related Course Outcomes: 1-17

4. Demonstrate competence with computers and technology.

Related Course Outcomes: 1 – 17

K. ASSESSMENT OF

STUDENT LEARNING: Achievement of the Course Outcomes will be measured by:

1. A minimum of 150 minutes of examination to be determined by the instructor. Test questions will include programming questions.

2. Several graded assignments that involve writing and executing small scripts.

3. Optional: Research project on computer related topics.

L. LEARNING RESOURCE

CENTER AND OTHER

SUPPORT:

Computer Lab and Library resources.

M. TOPICAL OUTLINE:	INSTRUCTIONAL PERIODS
I. INTRODUCTION	1 week
A. Basic file commands	
B. Basic system commands	
II. CONSOLE FILES.	1 week
A. stdin	
B. stdout	
C. stderr	
D. File redirection	
E. Appending to a file	
F. Using the &	
G. Unnamed pipes	
III. REGULAR EXPRESSIONS	2 weeks
A. What are regular expressions	
B. The meaning of square brackets([]), the caret(^) and the dollar(\$)	
C. The splat(*) symbol	
D. The plus(+) operator	
E. The curly braces({, })	
F. Place holders and word boundaries	
G. Using grep, egrep and fgrep	
H. The greedy aspect of regex	
IV. THE BASH SHELL	4 weeks
A. Shebang or !#	
B. Command interpreter	
C. Shell variables	
D. Null variables	
E. Shell variables vs environment variables	
F. I/O redirection	
G. Pipelines	
H. Variable expansion	
I. Arithmetic expressions in the shell	
J. Single and double quotes in the shell	
K. Positional parameters	
L. Using the "shift" command	
M. Conditionals in the script	
N. Loops in the script	
O. User input to a script	
P. Using the eval command in a script	
V. THE TSCH and KSH SHELL	2 weeks
A. Shebang or !#	
B. Command interpreter	
C. Shell variables	
D. Null variables	
E. Shell variables vs environment variables	
F. I/O redirection	
G. Pipelines	
H. Variable expansion	
I. Arithmetic expressions in the shell	
J. Single and double quotes in the shell	
K. Positional parameters	

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- M. Conditionals in the script
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- O. User input to a script
- P. Using the eval command in a script

VI. DOS/COMMAND PROMPT FOR WINDOWS 1 week

- A. File commands
- B. System commands
- C. File redirection
- D. Piping

VII. WINDOWS POWER SHELL 3 weeks

- A. Creating power shell objects
- B. Working with processes
- C. Working with files
- D. Creating/deleting folders
- E. WMI objects
- F. Parsing
- G. Interactive environment

VIII. Evaluation 1 week

LAB TOPICS (at the discretion of the instructor) INSTRUCTIONAL PERIODS

- 1. Bash basics. 1 week
- 2. Bash command line editing. 1 week
- 3. Bash basic shell programming. 1 week
- 4. Bash flow control. 1 week
- 5. Bash I/O and command line processing. 1 week
- 6. Regex manipulation. 1 week
- 7. Bash process handling. 1 week
- 8. Debugging bash shell programs. 1 week
- 9. Tsch command line editor and scripts. 1 week
- 10. Ksh command line editor and scripts. 1 week
- 11. DOS batch files. 1 week
- 12. Introduction to windows power shell scripting. 1 week
- 13. Interaction of windows power shell and files and processes. 1 week
- 14. WMI objects in power shell scripts. 1 week
- 15. Power shell scripts in an interactive environment 1 week

PREPARED BY: Anthony Kuroski 11/08