CAMOSUN COLLEGE
Trades and Technology
Electronics and Computer Engineering

ELEX 139B
PC Server Fundamentals
Fall 2019

COURSE OUTLINE

The calendar description is available on the web @	Online.camosun.ca

Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

Instructor Information

(a)	**Instructor**	Ian Cameron		
(b)	**Office hours**	TBA		
(c)	**Location**	TEC 211		
(d)	**Phone**	250 370 4439	**Alternative:**	
(e)	**E-mail**	cameron@camosun.bc.ca		

The focus of this course is advanced topics on Windows Server and an introduction to Linux. The students are introduced to Server management and administration. The students will create a working Client - Server based network. Students will be required to develop and implement a working file system, create user accounts and groups to implement a working domain structure and configure various server roles and services. The students will use both the UNIX command line interface and graphical user interfaces (GUI) to configure programs, files and directories, set file attributes and permissions, and configure drives and partitions.

Emphasis will be on configuration of the Client – Server environment based on the Microsoft 70-741 Networking with Windows Server 2016 exam. In addition, the LPI Linux material will be covered.

The student will be responsible for keeping up with the required reading and lab exercises.

Upon successful completion of this course a student will be able to:
- install and configure network operating systems;
- identify and describe the different server roles;
- describe the operation of server-based networks;
- perform server maintenance;
- configure and manage virtual servers and workstations;
- describe and practice disaster recovery methods for servers;
- perform operations on UNIX file systems, file storage, drives and partitions;
- modify UNIX file attributes and permissions;
- configure access control lists;
- explain basic shell scripts; and
- choose appropriate archive solutions.

Required Materials

(a) Text: Online - TestOut Server Pro 2016: Networking course pack. The information can be accessed through the TestOut (www.testout.com) once the course is purchased.

(b) NDG Linux Essentials hosted through the Cisco Net Academy

(c) Access to ELEX 139 Camosun D2L online course materials as required

Course Content

Week 1	**Reading and Assignment**

0.0 Introduction – Server Pro 2016:Networking Introduction
    0.1 Server Overview
    0.2 Virtual Machines
    0.3 Lab Configuration

Week 2	Chapter 1 – TestOut

1.0 DNS
    1.1 DNS Overview and Installation
    1.2 DNS Name Resolution
    1.3 Primary and Secondary DNS Zones
    1.4 Zone Properties and Auxiliary DNS Zones
    1.5 DNS Records
    1.6 DNS Record Management
    1.7 Single-Label Name Resolution
    1.8 DNS Server Properties
    1.9 DNS Protection
    1.10 DNS Policies
    1.11 DNS Monitoring and Troubleshooting

Week 3

2.0 TCP/IP	Chapter 2 – TestOut

    2.1 IPv4 Addresses
    2.2 IPv6 Addresses
    2.3 IPv4-to-IPv6 Transitional Technologies

Chapter 3 – TestOut

3.0 DHCP
    3.1 Install DHCP
    3.2 DHCP Scopes
    3.3 DHCP Options
    3.4 Advanced Scopes
    3.5 Centralized DHCP and PXE
    3.6 DHCP Policies
    3.7 Advanced DHCP Management
    3.8 Maintain the DHCP Database

10.4 Implement Windows Server Gateways
10.5 Implement Data Center Firewall Policies

Week 8

1.0 Module 1 – Introduction to Linux   Module 1/2/3 - Cisco

1.1 Linux is Everywhere
1.2 Linux is a Kernel
1.3 Linux is Open Source
1.4 Linux Has Distributions
1.5 Linux Embraces the CLI

2.0 Module 2 – Operating Systems
2.1 Operating Systems
2.2 Microsoft Windows
2.3 Apple macOS
2.4 Linux

3.0 Module 3 – Working in Linux
3.1 Navigating the Linux Desktop
3.2 Applications
3.3 Console Tools
3.4 Package Management
3.5 Development Languages
3.6 Security
3.7 The Cloud

Week 9   Modules 4/5/6 - Cisco

4.0 Module 4 – Open Source Software and Licensing
4.1 Introduction
4.2 Open Source Licensing
4.3 Open Source Business Models

5.0 Module 5 – Command Line Skills
5.1 Introduction
5.2 Shell
5.3 Commands
5.4 Variables
5.5 Command Types
5.6 Quoting
5.7 Control Statements

6.0 Module 6 – Getting Help
6.1 Introduction
6.2 Man Pages
6.3 Finding Commands and Documentation
6.4 Info Documentation
6.5 Additional Sources of Help

7.0 Module 7 – Navigating the Filesystem
    7.1 Introduction
    7.2 Directory Structure
    7.3 Paths
    7.4 Listing Files in a Directory

8.0 Module 8 – Managing Files and Directories
    8.1 Introduction
    8.2 Globbing
    8.3 Copying Files
    8.4 Moving Files
    8.5 Creating Files
    8.6 Removing Files
    8.7 Creating Directories

9.0 Module 9 – Archiving and Compression
    9.1 Introduction
    9.2 Compressing files
    9.3 Archiving Files
    9.4 ZIP files

10.0 Module 10 – Working With Text
    10.1 Introduction
    10.2 Command Line Pipes
    10.3 Input / Output Redirection
    10.4 Sorting Files or Input
    10.5 Viewing File Statistics
    10.6 Filter File Sections
    10.7 Filter File Contents
    10.8 Basic Regular Expressions

11.0 Module 11 – Basic Scripting
    11.1 Introduction
    11.2 Shell Scripts in a Nutshell
    11.3 Editing Shell Scripts
    11.4 Scripting Basics

13.0 Module 13 – Where Data is Stored   Modules 13/14 - Cisco
    13.1 Introduction
    13.2 Processes
    13.3 Memory
    13.4 Log Files
    13.5 Kernel Messages
    13.6 Filesystem Hierarchy Standard

14.0 Module 14 – Network Configuration
 14.1 Introduction
 14.2 Basic Network Terminology
 14.3 Networking Features Terminology
 14.4 IP Addresses
 14.5 Configuring Network Devices
 14.6 Network Tools

Week 13   Modules 15/16 - Cisco

15.0 Module 15 – System and User Security
 15.1 Introduction
 15.2 Administrative Accounts
 15.3 User Accounts
 15.4 System Accounts
 15.5 Group Accounts
 15.6 Viewing User Information
 15.7 Viewing Current Users
 15.8 Viewing Login History

16.0 Module 16 – Create Users and Groups
 16.1 Introduction
 16.2 Groups
 16.3 Users

Week 14   Modules 17/18 - Cisco

17.0 Module 17 – Ownership and Permissions
 17.1 Introduction
 17.2 File Ownership
 17.3 Changing Groups
 17.4 Changing Group Ownership
 17.5 Changing User Ownership
 17.6 Permissions
 17.7 Understanding Permissions
 17.8 Changing Permissions
 17.9 Default Permissions

18.0 Module 18 – Special Directories and Files
 18.1 Introduction
 18.2 Setuid
 18.3 Setgid
 18.4 Sticky Bit
 18.5 Links

21.0 Review

Lab Schedule

Week 1 – Introduction / Hyper-V / Active Directory
- Create Virtual Machines
- Windows Server Installation

Week 2 – DNS
- DNS Forwarding and Zones
- Records and DNS Tools

Week 3 – Addressing and DHCP
- Network Configuration
- DHCP Role

Week 4 – IPAM and Remote Access
- Routing and Remote Access
- Virtual Private Networks

Week 5 – Mid Term
- Mid Term Exam (2 hours)
- Second Server Configuration

Week 6 – NPS
- Network Policy Server
- RADIUS

Week 7 – NIC Teaming
- Configure NIC Teaming

Week 8 – Final Exam for Server / Using Linux
- Server Final (2 hours)
- Introduction to Linux

Week 9 – Command Line / Help
- Command Line Skills
- Getting Help

Week 10 – Files and Directories / Archiving / Compression
- Navigating the Filesystem
- Archiving and Compression

Week 11 – Mid Term / Pipes / Redirection / Scripting
- Mid Term Exam (2hours)
- Working with Text
- Basic Scripting

Week 12 – Packages and Processes / Network Configuration
- Where Data is Stored
- Network Configuration

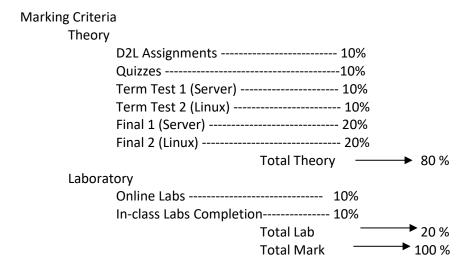Week 13 – System and User Security / User Accounts
- System and User Security
- Creating Users and Groups

Week 14 – Ownership and Permissions / Securing Permissions / File Locations / Cleanup
- Ownership and Permissions
- Special Directories and Files
- Cleanup

Basis of Student Assessment (Weighting)

Evaluation for this course will be a combined total of theory and laboratory marks as given below:

Marking Criteria
    Theory
        D2L Assignments ------------------------- 10%
        Quizzes ---------------------------------10%
        Term Test 1 (Server) --------------------- 10%
        Term Test 2 (Linux) ---------------------- 10%
        Final 1 (Server) --------------------------- 20%
        Final 2 (Linux) ----------------------------- 20%
                        Total Theory ⟶ 80 %
    Laboratory
        Online Labs ------------------------------ 10%
        In-class Labs Completion--------------- 10%
                  Total Lab ⟶ 20 %
                  Total Mark ⟶ 100 %

D2L Assignments are weekly assignments that must be completed and submitted to the correct dropbox by Sunday midnight each week. Missing, late, or incomplete assignments will be given a grade of zero.

Chapter quizzes will be based on the online TestOut material completed in class via D2L and on the Linux material through the Cisco LPI website.

There will be one term test for each topic – Server and Linux – spaced approximately half way through each topic – 5th and 12th weeks of the course and one final exam at the end of the server material (week 8) and at the end of the course on the Linux material during Final Exam Week.

The lab mark will consist of:

Online Labs – there are many virtual lab activities (TestOut) that will need to be completed throughout the course. Virtual lab activities need to be completed by Sunday midnight of the corresponding week. Missing, late, or incomplete labs will be given a grade of zero.

Completion of Labs – In-class labs must be completed by the end of the week and submitted to the correct dropbox by Sunday midnight each week. Missing, Late, or incomplete labs will be given a grade of zero.

It is the student responsibility to read the online Curriculum (TestOut or Linux) for that week in advance in order to develop a clear understanding of the content covered in class and lab.

Please note the following:

1. A grade of 50% or better is required in all assessment items above to be able to pass the course.
2. No late materials will be accepted past midnight of the last day of the course.
3. No opportunity will be available to write missed quizzes.
4. Attendance and completion of all lab material is mandatory to pass the course.

Grading System

| X | Standard Grading System (GPA)

| | Competency Based Grading System

Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College Calendar, Student Services or the College web site at http://www.camosun.bc.ca

STUDENT CONDUCT POLICY

There is a Student Conduct Policy. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College web site in the Policy Section.
http://www.camosun.bc.ca/policies/policies.html

A. **GRADING SYSTEMS** *http://www.camosun.bc.ca/policies/policies.php*

The following grading system is used at Camosun College:

1. **Standard Grading System (GPA)**

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0