COURSE SYLLABUS
SEC345: Hardening Linux

Course Description

Students will learn to audit, patch, and configure client/server operating systems on a Linux network. The course focuses on operating system security from a stand-alone and network client/server perspective. Emphasis will be placed on securing current version of operating systems agents, current threats, and future attacks.

General Course Information

Number of Units/Weeks	4/10
#Hours Lecture/#Hours Laboratory/#Hours Homework	40/00/80
Prerequisite(s)	None
Co-requisites (s)	None
Course Developer(s)	William Reid, MS
Date Approved / Last Review	Feb 2008 / Feb 2015

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Document current client and server vulnerabilities.
- Create a plan of action to fix known vulnerabilities.
- Use audit and security testing tools to identify vulnerabilities.
- Monitor clients and servers using both open and closed source security tools.
- Identify new security vulnerabilities and fixes via online sources.
- Discuss Linux client and server practices.
- Outline technical security requirements in a business environment.

Instructional Methods Employed in this Course

A number of instructional/learning methods are employed in this course, including the following:

- Lecture and reading assignments
- Hands-on exercises and labs
- Student presentations
- Team environment
- Practical application of theory and skills in authentic design projects
- Build on prior knowledge and experience of students to enhance richness of class activities.

Information Resources for this Course

Textbook

Madwachar, M. (2008). How to cheat at securing Linux. Burlington, MA: Syngress.

Other Materials

CentOS 5: http://www.centos.org

Bastille: http://sourceforge.net/projects/bastille-linux

Snort: http://www.snort.org Apache:

http://www.apache.org OpenSSL VPN:

http://www.openvpn.net

Web Site Readings

As assigned.

Table/Topics & Assignments

Types of Assignments:

Lecture -
Considered Lecture Hours

Classroom Discussion -
Considered Lecture Hours

In Class Critique -
Considered Lecture Hours

Delivering Oral Presentations -
Considered Lecture Hours

In Class (IC) Exercise -
Considered Lecture Hours

Reading -
Considered Homework (HW), work done outside of class

WebClass lesson (non-online courses) -
Considered HW, work done outside of class

Lab Work -
Considered Lab Hours

Quiz, Midterm or Final -
Considered Lecture Hours

Week 1						
Type	**Topic/Description**	**LEC Time**	**LAB Time**	**HW Time**	**Point Value**	**Du**
LEC 1A	Presenting the Business	1	0	0	0	
LEC 1B	Case for Open Source Software	1	0	0	0	
LEC 1C	Hardening the Operating System	2	0	0	0	
HW 1A	Text readings: Chapters 1 & 2 (88 pages) (Evaluated by HW 1B)	0	0	11	0	
HW 1B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 2
IC EX 1A	First Week Attendance	0	0	0	10	
Total Week 1		4	0	12	20	

Week 2						
Type	**Topic/Description**	**LEC Time**	**LAB Time**	**HW Time**	**Point Value**	**Due**
LEC2A	Enumeration and Scanning your Network	3.5	0	0	0	

LAB 2A	Project 1 Assigned: Five pages writing (2.5 hours), four citations (2 hr), textbook research 1 hr)	0.5	0	5.5	100	Beginning of Week Five
HW 2A	Text readings: Chapter 3 (28 pages) (Evaluated by HW 2B)	0	0	3.5	0	
HW 2B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 3
Total Week 2		4	0	10	110	

Week 3

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Du
LEC 3A	Intrusion Detection and Snort	3.5	0	0	0	
IC EX 3A	Quiz 1 (Chapters 1-3)	0.5	0	0	50	Week 3
HW 3A	Text readings: Chapter 4 (35 pages) (Evaluated by HW 3B)	0	0	4.4	0	
HW 3B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 4
Total Week 3		4	0	5.4	60	

Week 4

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due
LEC 4A	Installing & Configuring Snort & Add-Ons	1.5	0	0	0	
LEC 4B	Advanced Snort Deployment	2	0	0	0	
IC EX 4A	Quiz 2 (Chapter 4)	0.5	0	0	50	Week 4
HW 4A	Text readings: Chapters 5 & 6 (42 pages) (Evaluated by HW 4B)	0	0	5.3	0	
HW 4B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 5
Total Week 4		4	0	6.3	60	

Week 5

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due
LEC 5A	Network Analysis	1.5	0	0	0	
LEC 5B	Troubleshooting & Packet Sniffing	1.5	0	0	0	

HW 5A	Text readings: Chapter 7 (43 pages) (Evaluated by HW 5B)	0	0	5.4	0	
HW 5B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 6
HW 5C	Review of text readings: Chapters 1-6 (193 pages) (Evaluated by Midterm 5)	0	0	9.7	0	Week 5
EXAM 5A	Midterm Chapters 1-6	1	0	0	250	Week 5
Total Week 5		4	0	16.1	260	

Week 6

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due
LEC 6A	Basics of Cryptography & Encryption	3	0	0	0	
IC EX 6A	Quiz 3 (Chapter 7)	0.5	0	0	50	Week6
LAB 6A	Project 2 Assigned: Five pages writing (2.5 hours), four citations (2 hr), textbook research 1 hr)	0.5	0	5.5	100	Beginning of Week 9
HW 6A	Text readings: Chapter 8 (20 pages) (Evaluated by HW 6B)	0	0	2.5	0	
HW 6B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 7
Total Week 6		4	0	9.0	160	

Week 7

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due
LEC 7A	Perimeter Security, DMZs	2	0	0	0	
LEC 7B	Remote Access & VPNs	2	0	0	0	
HW 7A	Text readings: Chapter 9 (69 pages) (Evaluated by HW 7B)	0	0	8.6	0	
HW 7B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 8
Total Week 7		4	0	9.6	10	

Week 8

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due

LEC 8A	Linux Bastion Hosts	3.5	0	0	0	
IC EX 8A	Quiz 4 (Chapters 8 & 9)	0.5	0	0	50	Week 8
HW 8A	Text readings: Chapter 10 (41 pages) (Evaluated by HW 8B)	0	0	5.1	0	
HW 8B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 9
Total Week 8		4	0	6.1	60	

Week 9

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due
LEC 9A	Apache Web Server Hardening	4	0	0	0	
HW 9A	Text readings: Chapter 11 (17 pages) (Evaluated by HW 9B)	0	0	2.1	0	
HW 9B	Generate a 15 question quiz based on the chapter readings	0	0	1	10	Week 10
Total Week 9		4	0	3.1	10	

Week 10

Type	Topic/Description	LEC Time	LAB Time	HW Time	Point Value	Due
LEC10A	Review & Discussion	3	0	0	0	
HW 10A	Review of text readings: Chapters 1-11 (383 pages) (Evaluated by Final 10)	0	0	19.2	0	Week 10
EXAM 10A	Final Exam Chapters 7-11	1	0	0	250	
Total Week 10		4	0	19.2	250	Week 10

Course Hours Summary

Week	Topic	LEC Time	LAB Time	HW Time
1	Introduction to Hardening	4	0	12
2	Enumeration and Scanning	4	0	10
3	Intrusion Detection and Snort	4	0	5.4
4	Advanced Snort	4	0	6.3
5	Analysis and Packet Sniffing	4	0	16.1
6	Cryptography and Encryption	4	0	9
7	Security, Remote Access, and VPNs	4	0	9.6
8	Linux Bastion Hosts	4	0	6.1
9	Apache Web Server Hardening	4	0	3.1
10	Review and Final	4	0	19.2
Total		40	0	96.1

Table/Point Breakdown

Week	Assignment	Possible Points	Percent of
1	First Week Attendance	10	1
1	Self-Quiz Creation 1	10	1
2	Project 1	100	10
2	Self-Quiz Creation 2	10	1
3	Quiz 1	50	5
3	Self-Quiz Creation 3	10	1
4	Quiz 2	50	5
4	Self-Quiz Creation 4	10	1
5	Midterm Exam	250	25
5	Self-Quiz Creation 5	10	1
6	Quiz 3	50	5
6	Project 2	100	10
6	Self-Quiz Creation 6	10	1
7	Self-Quiz Creation 7	10	1
8	Quiz 4	50	5
8	Self-Quiz Creation 8	10	1
9	Self-Quiz Creation 9	10	1
10	Final Exam	250	25
Total		1000	100%

Your Grades for this Course

Your final grade for this course will be based on an assessment by the Instructor of your performance on a number of course activities, which may include objective tests, classroom exercises, laboratory demonstrations, project papers, or other types of activities. The chart below indicates in what activities you will engage, how many possible points can be earned for each activity, and the percentage of your final grade that will be accounted for by each activity.

Students in this course should be graded following Coleman University assessment practices and policies. A point system is used in the University to indicate student performance on various required activities or projects. For this course, it is recommended that points be distributed as follows:

Coleman University Grade Assignment Policy:

Percent	Letter Grade	Grade Points
94-100	A	4
90-93	A-	3.67
87-89	B+	3.33
84-86	B	3
80-83	B-	2.67
77-79	C+	2.33
74-76	C	2
70-73	C-	1.67
67-69	D+	1.33
64-66	D	1
60-63	D-	0.67
N/A	INC	0
N/A	W	0
60 or above	CR	0
59 or below	NC	0
N/A	I	0
N/A	W	0
N/A	AU	0
N/A	TR	0
N/A	WV	0

Legend	
CR = Credit	NC = No Credit
I = Incomplete	W = Course Withdrawal
AU = Audit	TR = Transfer Credit

WV = Waiver	

Academic Accommodation / Adjustment Policy:

In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), Coleman University offers accommodations to students with documented physical, psychological, and/or cognitive disabilities. Coleman University will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to offer equal educational opportunities to qualified disabled individuals.

To qualify for an academic accommodation under ADA, the student must provide adequate documentation of a disability. Students seeking academic accommodations should contact the campus ADA Coordinator at 858-966-3953 or via email at ada@coleman.edu. The ADA Coordinator will review the documentation provided and verify ADA coverage. Students covered under ADA must meet with the ADA Coordinator at the beginning of every term to determine the appropriate academic accommodations. Failing to meet with the ADA Coordinator at the beginning of every term may impact the availability of accommodations.

After the academic accommodations have been determined, the students' instructors will be notified by the ADA Coordinator. If any problems or concerns regarding the provision of accommodations occur, the student must inform the ADA Coordinator. If the student feels accommodation is not being made appropriately, the student may follow the published Student Grievance Procedures.