Scripting for Network Defense

IT 262 / CRN# 62340
Fall 2021
Instructor: James Hart
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Office Hrs: MW 12:00 PM – 3:00 PM
TTh   9:00 AM – 11:00 AM
or
ARR (through Zoom or phone)

COURSE DESCRIPTION

Scripting programming for security purposes. Students build on prior programming, operating systems, and security knowledge to develop, code, use, and debug new and existing scripts.

EMAIL

Be sure to check your contact information in Banner and keep it updated. UNM email as our official form of course communication. When communicating with your instructor always include class name in the subject header.

Student Learning Outcomes/Course Objectives

- Install and configure a Linux (Kali ?) and Windows host in a virtual environment
- Demonstrate basic Linux commands
- Compare and contrast physical vs. logical addressing using the OSI model
- Compare and contrast IP V4 and IP V6
- Define the purpose and their placement in the OSI model of TCP and UDP ports and then compare and contrast the two.
- Demonstrate using Wireshark to analyze given network situations using physical addressing, logical addressing, and ports.
- Demonstrate editing text files (bash script) with Linux commands and/or bash commands
- Demonstrate scanning a network for specific vulnerabilities with Nmap and its command line switches
- Demonstrate using Nmap's scripts from their scripting library
- Demonstrate editing text file (.bat) with MS-DOS commands
- Demonstrate scripting with Power Shell
- Demonstrate scripting with Python
- Show how to use Lua

TECHNICAL SKILLS

In order to participate and succeed in this class, you will need to be able to perform the following basic technical tasks:

- Use UNM Learn (help documentation located in "How to Use Learn" link on left course menu, and also at Online Student Documentation). Also, UNM-Valencia provides a Blackboard Learn Jumpstart self-learning module to give you practice with the most commonly used tools in UNM Learn. Ask your instructor if you do not see the UNM-Valencia Blackboard Learn Jumstart in your list of classes in UNM Learn.
- Use email – including attaching files, opening files, downloading attachments
- Use the in-course web conferencing tool (Collaborate Web Conferencing software in UNM Learn) or use Zoom or other web conferencing tool
- Download and install an application or plug in – required for participating in web conferencing sessions

TECHNICAL REQUIREMENTS

Computer
- A high-speed Internet connection is highly recommended.
- Supported browsers include: Detailed Supported Browsers and Operating Systems
- Any computer capable of running a recently updated web browser should be sufficient to access your online course. However, bear in mind that processor speed, amount of RAM and Internet connection speed can *greatly* affect performance.
- For the best experience when using the Kaltura Media Tools inside UNM Learn, be sure to use a supported browser on a desktop.
- Microsoft Office products are available free for all UNM students (more information on the UNM IT Software Distribution and Downloads page)
- Please update your contact information in Loboweb: MyUNM Login. When you log into MyUNM, Enter LoboWeb. Click on the Personal Information link to make sure your contact information is up to date.

Web Conferencing
Web conferencing will be used in this course during the following times and dates:
For the online sessions, you will need:
- *A USB headset with microphone. Headsets are widely available at stores that sell electronics, at the UNM Bookstore or online.*
- *A high-speed internet connection is highly recommended for these sessions. A wireless Internet connection may be used if successfully tested for audio quality prior to web conferencing.*

- *You should also dress as you would when attending an in-person class, even if you do not turn on your video camera.*

Technical Support
- For UNM Learn Technical Support: (505) 277-0857 (24/7) or use the "Create a Tech Support Ticket" link in your course.
- For UNM-Valencia IT Support: (505)925-8911
- For UNM Web Conference Technical Help: (505) 277-0857

Required Textbooks and References:

- Non required but suggested

Supplementary Materials:

- Linux Basics for Hackers; Occupytheweb; No Starch Press; ISBN# 978-1-59327-855-7
- NMAP Network Scanning; Gordon Lyon; Insecure; ISBN# 978-0-9799587-1-7
- Wireshark Network Analysis; Laura Chappell; Chappell University; ISBN# 978-1893939943

Required Supplementary Materials:
USB Flash Drive (at least 16G)

COURSEWORK AND PARTICIPATION

Instructor Response Time
I routinely check the course for postings or emails, Monday through Friday between 7:00 and 10:00 AM. You can anticipate a 24 to 48 hour response from me. If you MUST contact me, please text, but don't forget I sleep too.

Procedures for Completing Coursework

- *Tests and quizzes are posted for completion on UNM Learn, they need to be taken online. If you have difficulty competing this work, contact your instructor. For most assignments you will have 1 week to complete. If you cannot complete, notify me for options*

Course Schedule
There will be one to two recorded lectures per week. Each lecture will have a phrase (ex. "dogs bark"). Who knows where it will appear. To get credit for the lecture you must email me the phrase. The phrase could be anywhere in the lecture.

Expectations for Participation

- *time required (9-12 hrs per week)*
- *students are expected to keep abreast of course announcements*
- *students are expected to use the Learn course email as opposed to a personal email address*
- *students are expected to keep instructor informed of class related problems, or problems that may prevent the student from full participation*
- *students are expected to address technical problems immediately*
- *students are expected to observe course netiquette at all times*

Netiquette
- *Netiquette document*

NOTES TO STUDENTS ABOUT PARTICIPATION IN A COURSE USING UNM LEARN:

Tracking Course Activity
UNM Learn and Cisco Netacad automatically records all students' activities including: your first and last access to the course, the pages you have accessed, the number of discussion messages you have read and sent, web conferencing, discussion text, and posted discussion topics. This data can be accessed by the instructor to evaluate class participation and to identify students having difficulty

Grading Scale

		A 90 +
Lecture Attendance	10%	B 80 - 89
Labs	30%	C 70 - 79
Tests	30%	D 60 - 69
Final	30%	F < 60
Total	100%	
	F	

UNM POLICIES

Equal Opportunity and Non-Discrimination
In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see pg. 15). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity.
Read more about campus policy regarding sexual misconduct.

Copyright Issues
All materials in this course fall under copyright laws and should not be downloaded, distributed, or used by students for any purpose outside this course.

The UNM Copyright Guide has additional helpful information on this topic.

Accessibility and Accommodations
The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodations of their disabilities. If you have a disability requiring accommodation, please contact:

- UNM-Valencia Student Services if you are a Valencia campus student. The phone number is 505-925-8560
- UNM Accessibility Resource Center in 2021 Mesa Vista Hall if you are a main campus student. The phone number is 505-277-3506.

Information about your disability is confidential and your instructor cannot refer you for accommodations. Be aware that you will need to provide documentation. If you need assistance in obtaining documentation, the offices above can assist you.

Accessibility Statements
Blackboard's Accessibility statement
Microsoft's Accessibility statement
Include links to accessibility statements for all other technologies included in the course.

Academic Integrity
You should be familiar with UNM's Policy on Academic Dishonesty and the Student Code of Conduct which outline academic misconduct defined as plagiarism, cheating, fabrication, or facilitating any such act.

Drop Policy

UNM Policies: This course falls under all UNM policies for last day to drop courses, etc. Please see or the UNM Course Catalog for information on UNM services and policies. Please see the UNM academic calendar for course dates, the last day to drop courses without penalty, and for financial disenrollment dates.

UNM RESOURCES

- **UNM Valencia Campus Tutoring Services**

- **UNM Main Campus CAPS Tutoring Services**

- **UNM-Valencia Library**

- **UNM Libraries**

- **"Life" Resources available to UNM-Valencia Students**

- **Student Health & Counseling (SHAC) Online Services**

FOR MILITARY-CONNECTED STUDENTS
There are resources on campus designed to help you succeed. You can approach any faculty or staff for help with any issues you may encounter. Many faculty and staff have completed the GREEN ZONE training to learn about the unique challenges facing military-connected students. If you feel that you need help beyond what faculty and/or staff can give you, please reach out to the Veterans Resource Center on main campus at 505-277-3181, or by email at vrc@unm.edu. The Veterans Coordinator at UNM-Valencia is in the Student Services Office, at 505-925-8560.

SEMESTER DATES AND DEADLINES

- 3-Sep   Enrollment Cancellation for non-payment
- 3-Sep   Last day to ADD sections and CHANGE credit hours on LoboWEB.
- 3-Sep   Last day to CHANGE grade mode on LoboWEB.
- 6-Sep   *Labor Day*
- 10-Sep   Last day to DROP without "W" grade and 100% tuition refund on LoboWeb.
- 10-Sep   Last day to ADD sections and/or CHANGE credit hours with form, $10 per transaction. After this date $75.
- 14&15 Oct   *Fall Break*
- 12-Nov   Last day to DROP without Dean's Permission on LoboWEB.
- 25&26 Nov   *Thanksgiving*
- 10-Dec   Last Day for CHANGE grade mode with form

Last update: 08/21/21

- 10-Dec   Last Day to ADD sections and/or CHANGE credit hours with forms $75 per transaction.
- 10-Dec   Last day to DROP with Dean's Permission with form.
- 13-Dec   *Finals Week*
- 17-Dec   Last day to report removal of Incomplete.

COURSE OUTLINE (*Please note that this course outline is subject to change. If changes occur, you will be notified*)

Week 1 / August 23

Installing computers in a virtual environment

- VMware setup
- Install VMs
- Linux basics
- Linux commands

Week 2 / August 30

- More with Linux Commands
- Physical and Logical Addressing
- TCP and UDP ports
- Wireshark

Week 3 / September 6

- Writing a bash script
- Wireshark

Week 4 / September 13

- More bash scripting
- Wireshark

Week 5 / September 20

- Nmap and its switches

Week 6 / September 27

- Nmap scripting
- Intro to Lua

Week 7 / Oct 4

- Intro to Metasploit

Week 8 / October 11

- More Nmap and Wireshark
- Intro to Python

Week 9 / October 18   *MITERM*

To be continued……. Kali and More scripting with .bat, Power Shell, and Python