Department of Information Sciences and Technology

Volgenau School of Engineering

**IT 352 Security Administration of Linux Systems
Spring 2017**

Common Syllabus   revised 3/30/2017

This syllabus contains information common to all sections of IT 352 for the Spring 2017 semester. Information specific to each section will be made available to registered students via the Blackboard course management system.

University Policies

The University Catalog is the central resource for university policies affecting student, faculty, and staff conduct in university affairs. Unless explicitly noted, any conflict between the policies in the University Catalog and the content of this document is unintentional. Please notify the author to resolve any such conflicts.

Please note that the Academic Year runs from the Fall semester of one calendar year through the Spring and Summer semesters of the following calendar year. Please be sure to select the correct archived Catalog if appropriate.

Scheduled Sections

Section	Instructor	Campus	Day	Time
DL1	Prof. Lyons	Online		

Course Description

> ### IT 352 - Security Administration of Linux Systems
>
> Provides theoretical foundation and practical experience installing, configuring, and maintaining Linux systems with an emphasis on best practices for security. Students develop a heterogeneous suite of clients and servers with firewalls and other networking components.

From http://catalog.gmu.edu/preview_course.php?catoid=29&coid=318018

Prerequisites

The prerequisites for this course are:

All of the following:

- A grade of "B" or better in IT 223;
- A grade of "C" or better in IT 105 or (IT 101 and IT 212);
- A grade of "C" or better in IT 106 or IT 196 or CS 112;

- The minimum grade as shown above **must** be achieved in each prerequisite course **before** a student is qualified to take this course. The prerequisite courses must be completed prior to, not concurrently with, this course.

This requirement will be **strictly enforced**. Any student who does not meet the prerequisite requirement will be dropped from the course by the Instructor at the start of the semester and the student will be responsible for any consequences of being dropped.

Rationale

This course develops an understanding of the information security services required in typical operating system implementation and provides substantial hands-on experience in installing, configuring, and maintaining a heterogeneous collection of systems including clients, servers, and networking components including firewalls.

The focus of this course is on implementations of the Linux operating system, the basis of many non-proprietary operating systems in use today. The evolution of Linux from GNU into a variety of popular variants (including Fedora, Ubuntu, Debian, Android, and others) is discussed and students will examine similarities and differences between the variants for similar tasks.

This course uses the "flipped" model of instruction where students review online materials prior to group instruction. Lectures will be delivered online in asynchronous mode, and live interactive sessions will be conducted to facilitate discussion and resolution of issues with assignments.

Each student will develop a collection of systems and will be able to demonstrate correct interaction and resistance against typical threats including system and infrastructure failures, human errors, and attacks.

This course extends the network security offerings in the Information Security (INFS) concentration of the IT major. The content is relevant to students currently or expecting to be working in information security, especially in network security and systems administration.

Course Applicability

IT 352 is an option in the Information Security (INFS) concentration of the Bachelor of Science in Information Technology, and a Technical Focus Course in the Information Technology Minor and the Information Technology Undergraduate Certificate.

Objectives

On successful completion of this course, students will be able to:

− Explain the origin of the Linux operating system and describe characteristics of the major variants.

− Install a Linux-based operating system from storage media and over a network connection.

− Configure a system (including networking) to address typical security issues.

− Maintain a system (including backup and restoration, integrity checks, and status reports).

− Demonstrate protection against natural events, human errors, and attacks.

Faculty and Staff

Course Coordinator:
    Michael X. Lyons

Instructor:
    Section DL1   Michael X. Lyons

Teaching Assistant:
    To be assigned – see Blackboard

Administrative support:
    Department of Information Sciences and Technology
    Fairfax campus
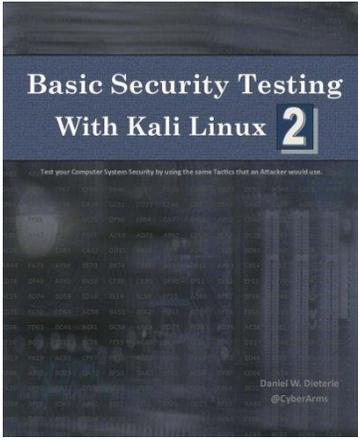   5400 Nguyen Engineering Building
    Email: bsit@gmu.edu
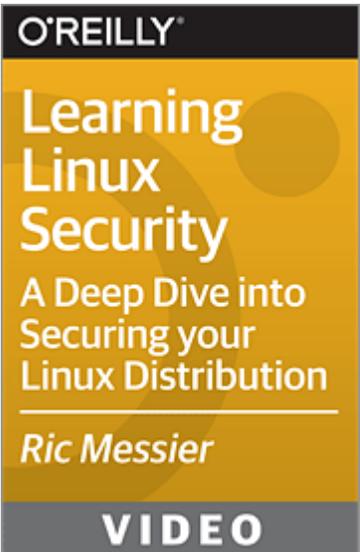   Phone: 703−993−3565

References

Textbooks

There is one required textbook for this course:

	Basic Security Testing with Kali Linux 2
	Daniel W. Dieterle
	2016; CreateSpace Independent Publishing Platform
	
	Publisher's pricing (as of 1/27/2017):
	    Paperback `$28.23`
	    Kindle `$16.00`
	
	This textbook is available in printed and electronic formats. See the publisher's Web page for more information.

Online references

This course will make extensive use of an online video series:

	Learning Linux Security: A Deep Dive into Securing your Linux Distribution ISECOM © 2015, Ric Messier Publisher's pricing (as of 10/5/2015): Electronic `$99.95` This textbook is available in printed and electronic formats. See the publisher's Web page for more information.

Grading

Grades will be awarded in accordance with the Mason Grading System for undergraduate students. See the University Catalog, Academic Policies, AP.3.1 Undergraduate Grading for more information.

The grading scale for this course is:

```
97 - 100%   A+    Passing
93 -  96%   A     Passing
90 -  92%   A-    Passing
87 -  89%   B+    Passing
83 -  86%   B     Passing
80 -  82%   B-    Passing
77 -  79%   C+    Passing
73 -  76%   C     Passing
70 -  72%   C-    Passing*
60 -  69%   D     Passing*
 0 -  59%   F     Failing
```

* Grades of "C-" and "D" are considered passing grades for undergraduate courses. However:

- As of Catalog Year 2015-16 a minimum grade of "C" is required in all Concentration courses in the IT major in order to apply those courses toward graduation.

Raw scores may be adjusted by the Instructor to calculate final grades.

Final grades will be based on the following components:

```
Lecture responses  10%
Assignments        40%
Mid-term exam      25%
Final exam         25%
```

Lecture responses

Following each lecture students will be given a fixed period of time in which to post a response to a topic posted by the Instructor. These responses are intended to expand on the lecture content *and* to encourage students to keep up with the lecture material on a weekly basis.

There is no "grace period" for these responses
– any response submitted late will not be graded.

Assignments

Individual work will be assigned throughout the semester.
Each assignment is to be prepared and submitted as specified by the Instructor.
Each assignment will count towards the final grade - there are no "optional" assignments.

Students are expected to submit work as scheduled by the Instructor. Any assignment submitted after the due date-time but within 24 hours of it will be graded with a penalty of 25% of the available credit. Any assignment submitted more than 24 hours late will not be graded.

Mid-term exam

The mid-term exam will be conducted on campus on a date to be advised. It will be based on topics addressed in the first 5 weeks of the course and will be "closed book" – no reference materials other than those provided with the exam paper will be permitted. Mid-term exams will be returned to students once all mid-term exams for all sections have been graded.

Students in online sections are required to attend the scheduled exam in person, or to arrange for a proctored exam.

Final exam

The final exam will be conducted on campus on a date to be advised during the final exam period (see the Spring 2017 Final Exam Schedule). It will be based on topics addressed throughout the entire course and will be "closed book" – no reference materials other than those provided with the exam paper will be permitted. Final exams will be retained by the Department of Information Sciences and Technology and will not be returned to students.

Students in online sections are required to attend the scheduled exam in person, or to arrange for a proctored exam.

Mid-term and final grades will be posted to PatriotWeb, which is the only mechanism for students to obtain those grades. A student with a "hold" on his/her PatriotWeb account will be unable to access grades until the hold has been removed by the Registrar.

Schedule

Lecture	Content
1	Introductions, Logistics, Overview; Evolution of Linux and major variants
2	Virtualization; Development, test, and production environments
3	The boot process; Run levels
4	System installation and configuration; The kernel and modules
5	Accounts and permissions; Review for mid-term exam
6	**Mid-term exam**
7	Networking – part 1
8	Networking – part 2
9	Wireless security
10	Firewalls
11	Intrusion detection and prevention
12	Common applications: LAMP
13	Logging and auditing
14	Review for final exam
–	**Final exam**

This schedule is subject to revision before and throughout the course.
Registered students should see Blackboard for the latest class schedule.

Important Dates

Please see the Spring 2017 Semester Calendar for important dates,
including the last days to add and drop courses.

Religious Holidays

A list of religious holidays is published by University Life. Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor *at least 2 weeks in advance* of the conflict date in order to make alternative arrangements.

Attendance Policy

Students are expected to attend every class, to complete any required preparatory work (including assigned reading – see **Schedule** above) and to participate actively in lectures, discussions and exercises. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor as soon as possible if they miss any class without prior notice. Any student who expects to miss more than one class session is **strongly advised** to drop the course and take it in a later semester when he/she can attend every class.

Mason policy requires students to take exams at the scheduled time and place, unless prior approval is granted by the student's academic dean or director. Failure to attend a scheduled exam will result in a score of zero (0) for that exam. Please note that exams may be re-scheduled by the Registrar to compensate for disruptions in the semester schedule and *students are required to be available throughout the exam period including the scheduled Make-up Day*.

Classroom conduct

Students are expected to conduct themselves in a manner that is conducive to learning, as directed by the Instructor. Any student who negatively impacts the opportunity for other students to learn may be asked to leave the classroom.

Electronic devices are potential distractions in the classroom environment. All electronic devices must be turned off or set to "silent" mode at all times unless the Instructors directs otherwise. In order to maximize student engagement the Instructor may prohibit use of such devices.

Communications

Registered students will be given access to a Blackboard section for this course. Blackboard will used as the primary mechanism (outside of lectures) to disseminate course information, including announcements, lecture slides, homework and other assignments, and scores for homework and exams. Some announcements may be sent via Blackboard to students' Mason email accounts.

Communication with the Instructor on issues relating to the individual student only should be conducted using Mason email, via telephone, or in person - *not* in the public "Discussions" forums on Blackboard. To protect student privacy any communication related in any way to a student's status must be conducted using secure Mason systems – if you use email to communicate with the Instructor you *MUST* send messages from your Mason email account. Students must activate and monitor their Mason email accounts to receive important information from the University, including messages related to this class.

Lecture slides are complements to the lecture process, not substitutes for it - access to lecture slides will be provided in Blackboard as a courtesy to students *provided acceptable attendance is maintained*.

All course materials (lecture slides, assignment specifications, *etc*) are published on Blackboard in Adobe® Portable Document Format (PDF). This allows users of most computing platforms to view and print these files. Microsoft® Word (or a compatible word processing application) is required for preparing assignments – it is available on computers in the Mason open labs.

Online sections will use several tools through the Blackboard course management system. Students are responsible for obtaining Internet access and a compatible platform. Appropriate computers are available on campus in open labs.

Privacy

Instructors respect and protect the privacy of information related to individual students.

As described above, issues relating to an individual student will be discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student.

Homework, quizzes, mid-term exams and other assessable work will be returned to individual students directly by the Instructor (or by a faculty member, staff member, or Teaching Assistant designated by the Instructor, or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Instructors, staff, and Teaching Assistants will take care to protect the privacy of each student's scores and grades.

Disability Accommodations

Disability Services works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with Disability Services as soon as possible and take advantage of the services offered.

Accommodations for disabled students *must* be made in advance – Disability Services cannot assist students retroactively. Any student who needs accommodation should contact the Instructor no later than the first class.

Campus Notifications

Students are encouraged to subscribe to the Mason Alert system to receive notifications of campus emergencies, closings, and other situations that could affect class activities.

Each classroom has a poster explaining actions to be taken in different types of crisis. Further information on emergency procedures is available at the Campus Emergency Response Team Web site In the event of an emergency, students are encouraged to dial 911.

Other Resources

Mason provides many useful resources for students.
The following resources may be particularly useful:

- The Writing Center

- The Academic Advising Center

- The University Libraries

- Counseling and Psychological Services

- University Career Services

See http://www.gmu.edu/resources/students/
for a complete listing of Mason resources for students.

Academic Integrity

All members of the Mason community are expected to uphold the principles of scholarly ethics.

The IT major bas been designed to achieve several specific outcomes. One of those outcomes is:
"*An understanding of professional, ethical, legal, security, and social issues and responsibilities.*"

Graduating students are bound by the ethical requirements of the professional communities they join.
The ethics requirements for some of the communities relevant to IT graduates are available via the
following links:

- ACM Code of Ethics and Professional Conduct

- IEEE Code of Ethics

- EC-Council Code of Ethics

On admission to Mason, students agree to comply with the requirements of the Mason Honor Code.
The Honor Code will be **strictly enforced** in this course. Honor Code cases are heard by a panel of
students – students who meet the requirements are encouraged to nominate themselves to serve on
the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies
the material used and its source in an appropriate manner, is **plagiarism** and will not be tolerated.
The Instructor reserves the right to use manual and/or automated means (including such services as
SafeAssign) to detect plagiarism in any work submitted by students for this course, and to direct
Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this
course.

For this course, the following requirements are specified:

- All assessable work is to be prepared by the individual student,
  unless the Instructor explicitly directs otherwise.

- All work must be newly created by the individual student for this course for this semester.
  Any usage of work developed for another course, or for this course in a prior semester, is
  strictly prohibited without prior approval from the Instructor.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need),
provided:

- The directions for the assigned work do not prohibit such assistance.

- Such assistance is ***explicitly acknowledged*** in the submitted work, clearly identifying the
  person(s) giving assistance and the nature of the assistance given.

- Any work to be submitted is prepared entirely and exclusively by the student submitting it.
  Students are expressly prohibited from sharing any assessable work for this course in any
  manner with other students (except students assigned as Teaching Assistants or
  Undergraduate Peer Mentors to this course and the student's section), unless all students
  involved have had their work graded and returned by the Instructor, or the Instructor has
  explicitly approved such sharing.

Another aspect of academic integrity is the free exchange of ideas. Vigorous discussion and debate
are encouraged in this course, with the firm expectation that all aspects of the class will be conducted
with civility and respect for differing ideas, perspectives, and traditions. Please see the Mason
Diversity Statement for more information on this topic.

Students are encouraged to ask for clarification of any issues related to academic integrity and to
seek guidance from the Instructor, other faculty members, academic advisors, or the Office for
Academic Integrity.