

Department Name and Number	Computer and Information Science and Engineering	1914000
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Recommended SCNS Course Identification			
Prefix	C	O	P
		Level	5
		Course Number	X X X
Full Course Title <u>Penetration Testing - Ethical Hacking</u>			
Transcript Title (please limit to 21 characters) <u>Penetration Testing</u>			

Effective Term and Year <u>Spring 2014</u>	Rotating Topic <input type="radio"/> yes <input checked="" type="radio"/> no
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Amount of Credit <u>3</u>	Contact Hour: Base <u>3</u>	or Headcount <u> </u>	S/U Only <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
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Repeatable Credit <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	If yes, <u> </u> total repeatable credit allowed
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Variable Credit <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	If yes, <u> </u> minimum and <u> </u> maximum credits per semester
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Course Description (50 words or less)
Introduction to the principles and techniques associated with the cybersecurity practice known as penetration testing or ethical hacking. The course covers planning, reconnaissance, scanning, exploitation, post-exploitation, and result reporting. The student discovers how system vulnerabilities can be exploited and learns to avoid such problems.

Prerequisites Graduate Status	Co-requisites
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Degree Type (mark all that apply)	<input checked="" type="checkbox"/> Baccalaureate	<input checked="" type="checkbox"/> Graduate	<input type="checkbox"/> Professional	<input type="checkbox"/> Other <u> </u>
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Category of Instruction	<input checked="" type="checkbox"/> Introductory	<input type="checkbox"/> Intermediate	<input type="checkbox"/> Advanced
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Rationale and place in curriculum
Penetration testing has become an increasingly important area of cybersecurity practice over the past decade. Understanding its underpinnings and proper application is an important element of any computing manager's background. Graduate students who take industry positions will benefit from a full understanding of this area. In distinction to the undergraduate section, graduate students will engage in individual projects to further their understanding and expertise in the underlying subject area.

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COP 5XXX Penetration Testing—Ethical Hacking

Note: Differences between the method of evaluation in this course and the like-named undergraduate course are underlined in item 14.

1. Catalog Description (3 credit hours) – Introduction to the principles and techniques associated with the cybersecurity practice known as penetration testing or ethical hacking. The course covers planning, reconnaissance, scanning, exploitation, post-exploitation, and result reporting. The student discovers how system vulnerabilities can be exploited and learns to avoid such problems.
2. Pre-requisites and Co-requisites
Graduate Standing
3. Course Objectives
This course teaches students the underlying principles and many of the techniques associated with the cybersecurity practice known as *penetration testing* or *ethical hacking*. Students will learn about the entire penetration testing process including planning, reconnaissance, scanning, exploitation, post-exploitation, and result reporting. The course will provide the fundamental information associated with each of the methods employed and insecurities identified. In all cases, remedial techniques will be explored. Students will develop an excellent understanding of current cybersecurity issues and ways that user, administrator, and programmer errors can lead to exploitable insecurities.
4. Instructor
 - a. Office location: CSE E472
 - b. Telephone: 352-514-2191
 - c. E-mail address: jnw@cise.ufl.edu
 - d. Class Web site: <http://www.cise.ufl.edu/~jnw/cis4930fa13/>
 - e. Office hours:
T 5:00 PM – 7:00 PM
R 5:00 PM – 6:00 PM
5. Teaching Assistant
 - a. Office location: TBA
 - b. Telephone: TBA
 - c. E-mail address: sooshiant@ufl.edu
 - d. Office hours:
M 3:00 PM – 5:00 PM
W 3:00 PM – 5:00 PM
6. Meeting Times
T 7
R 7-8
7. Class/laboratory schedule, i.e., number of sessions each week and duration of each session
Class meetings only, 50 minutes per class
8. Meeting Location
MAEB 211

9. Material and Supply Fees

N/A

10. Textbooks and Software Required

- a. Title: Hacking Exposed
- b. Author: Stuart McClure, Joel Scambray, George Kurtz
- c. Publication date and edition: 2012, 7th Edition
- d. ISBN number: ISBN 978-0-07-178028-5

Software: VMWare Workstation or VMWare Fusion (www.vmware.com)

Kali Linux (www.kali.org)

11. Recommended Reading

Numerous security-related documents, twitter feeds, and other online information sources.

12. Course Outline (43 lecture hours)

- a. Aug 22 (2) Introduction, software installation, Pre-engagement, scoping
- b. Aug 27 (1) ethical requirements and legal issues
- c. Aug 29 (2) Penetration test report structure and components
- d. Sep 3 (1) Reconnaissance
- e. Sep 5 (2) DNS, web reconnaissance
- f. Sep 10 (1) TCP, UDP, connections
- g. Sep 12 (2) scanning using nmap
- h. Sep 17 (1) ftp, http, telnet
- i. Sep 19 (2) SSL and TLS encryption
- j. Sep 24 (1) NetBIOS and NFS
- k. Sep 26 (2) Encryption essentials
- l. Oct 1 (1) Windows passwords, hashes
- m. Oct 3 (2) Rainbow tables, linux passwords, hashes with salt
- n. Oct 8 (1) Searching linux and Windows file systems
- o. Oct 9 (2) Metasploit exploitation framework
- p. Oct 15 (1) netcat and pivoting
- q. Oct 17 (2) VOIP
- r. Oct 22 (1) Wireless networks and encryption
- s. Oct 23 (2) Lock picking, master keys, and oracle hacks
- t. Oct 29 (1) Cryptography weaknesses
- u. Oct 31 (2) http, javascript, and command injection
- v. Nov 5 (1) Databases, SQL, SQL injection
- w. Nov 7 (2) Browser proxies and non-rendered content, cross-site scripting
- x. Nov 12 (1) Cross-site scripting and cross-site request forgery
- y. Nov 14 (2) Web authentication and session management
- z. Nov 19 (1) Mobile device security issues
- aa. Nov 21 (2) mobile devices and student presentations
- bb. Nov 26 (1) Student presentations
- cc. Dec 3 (1) Student presentations and recap for final exam

13. Attendance and Expectations

Students are expected to attend every class. University of Florida policy for excused absences applies.

14. Grading – methods of evaluation

Grading is based on attendance, lab exercises (in which the student must successfully solve a number of challenge problems, one per week), participation in Sakai discussions, individual project grade, and final examination. Attendance is equally weighted for every class period. Excused absences (see course catalog) will not be deducted nor will three unexcused absences. Any other absence is deducted from your attendance grade. The individual project will involve independent development of sample lab exercises for future classes or contribution to an open-source security project. The final examination will be similar to an industry examination such as SANS GIAC or ECCouncil CEH.

Attendance: 10%

Sakai Discussion Participation: 10%

Lab Exercises: 30%

Project: 30%

Final Examination: 20%

15. Grading Scale

Notation:

$[m,n]$ includes all values x such that $m \leq x \leq n$.

$[m,n)$ includes all values x such that $m \leq x < n$.

A $[93,100]$

A- $[90,93)$

B+ $[87,90)$

B $[83,87)$

B- $[80,83)$

C+ $[77,80)$

C $[73,77)$

C- $[70,73)$

D+ $[67,70)$

D $[63,67)$

D- $[60,63)$

F $[0,60)$

Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

16. Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

17. Honesty Policy – UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See <http://www.dso.ufl.edu/sccr/procedures/honorcode.php>

18. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
19. UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, <http://www.counseling.ufl.edu/cwc/Default.aspx>, counseling services and mental health services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
 - University Police Department 392-1111
20. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.
21. Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

All UCC1 forms and each UCC2 form that proposes a change in the course description or credit hours must include this checklist in addition to a complete syllabus. Check the box if the attached syllabus includes the indicated information.

Syllabus MUST contain the following information:

Instructor contact information (and TA if applicable)

Course objectives and/or goals

A weekly course schedule of topics and assignments

Required and recommended textbooks

Methods by which students will be evaluated and their grades determined

A statement related to class attendance, make-up exams and other work such as: "Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>."

A statement related to accommodations for students with disabilities such as: "Students requesting classroom accommodation must first register with the Dean of Student Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation."

Information on current UF grading policies for assigning grade points. This may be achieved by including a link to the appropriate undergraduate catalog web page:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

A statement informing students of the online course evaluation process such as: "Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu>."

It is recommended that syllabi contain the following information:

1. Critical dates for exams and other work
2. Class demeanor expected by the professor (e.g., tardiness, cell phone usage)
3. UF's honesty policy regarding cheating, plagiarism, etc. Suggested wording: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.
4. Phone number and contact site for university counseling services and mental health services: 392-1575, <http://www.counseling.ufl.edu/cwc/Default.aspx>
University Police Department: 392-1111 or 9-1-1 for emergencies.

The University's complete Syllabus Policy can be found at: http://www.aa.ufl.edu/Data/Sites/18/media/policies/syllabi_policy.pdf