



Prince Sultan University

College of Computer and Info Sciences / Department of Computer Science

Term 252

2nd Semester 2025 – 2026

COURSE SYLLABUS

Mission Statement of the Bachelor of Computer Science Program(s):

- 1- **Course number and name:** CYS405, Penetration Testing and Ethical Hacking
- 2- **Credits and contact hours:** 3 credits and 4 contact hours (Lectures: 40 Tutorials: 10 Lab: 10)
- 3- **Instructor's or course coordinator's name:** [Dr.Mona Alkanhal](#)
 - a. **Scheduled Office Hours:** Sun, Mon, Tue, 11:00-11:50 am , Wed, 11:00-12:50
 - b. **Office Location:** Building 101, Office: W335
 - c. **Email:** malkanhal@psu.edu.sa
- 4- **Textbook, title, author, and year**
 - a. **Primary Text:** Sean-Philip Oriyano, Michael G. Solomon (2018). Hacker techniques, tools, and incident handling 3rd ed.). Burlington, MA: Jones & Bartlett Learning. ISBN: 978-1284147803
 - b. **Other References:** Chuck Easttom (2018). Penetration Testing Fundamentals: a Hands-On Guide to Reliable Security Audits. Person Publications. ISBN: 0789759373
 - c. **Course Website [Optional]:**
 - d. **Learning Management System:** Moodle available at <https://lms.psu.edu.sa>
- 5- **Specific course information**
 - a. **Brief description of the content of the course (catalog description):** This course covers the study of techniques used by hackers to break into an organization. It gives students the necessary tools to have a hacker mind-set in order to protect network against future attacks. It gives an introduction to the principles and techniques associated with cybersecurity practice known as penetration testing or ethical hacking. This course illustrates the differences between ethical and unethical penetration testing, describes and explains the phases of a penetration test including planning, reconnaissance, scanning, exploitation, post-exploitation, and result reporting. Students will be able to apply different tools and methods to conduct penetration tests for the purpose of discovering how system vulnerabilities can be exploited and learn to avoid such problems.
 - b. **Prerequisites or co-requisites:** CS331, CYS401
 - c. **Indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program:** elective course in CS and SE programs and required course in the CS-CYS and SE-CYS tracks
- 6- **Specific goals for the course**



a. Specific outcomes of instruction. The student will be able to:

CLO1: Evaluate the differences between ethical and unethical penetration testing

CLO2: Discuss the Lifecycle of cybersecurity attacks including attacks concepts, phases, methodologies, and tools from an ethical hacking perspective..

CLO3: Conduct experiments on how to test IT infrastructure and information systems for vulnerabilities to malicious attack.

CLO4: Examine different cybersecurity attacks and their countermeasures.

CLO5: Apply different penetration testing tools to review/evaluate the security of a given system.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

Course LOs #	Computer Science	Software Engineering
1	4	4
2	1	1
3	2	6
4	6	6
5	2	6

7- Brief list of topics to be covered

Week No.	Topics	CLO(s) alignment	Assessments
Week 1	Introduction [Group formation/ Projects Distribution] Introduction to Ethical Hacking and Penetration Testing	CLO1, CLO 2	Assignment
Week 2	Information Gathering – Footprinting & Reconnaissance	CLO2, CLO3 CLO 4, CLO 5	Assignment
Week 3	Scanning	CLO2, CLO 3, CLO 4, CLO 5	Assignment
Week 4	Enumeration	CLO2, CLO 3, CLO 4, CLO 5	Quiz 1(5%) 19th Jan, break time
Week 5	Vulnerability analysis	CLO 2, CLO 4, CLO 5	Assignment

Week 6-7	System Hacking	CLO2, CLO 3, CLO 5	Major 1 (10%) 9 February 2026
Week 8	Malware	CLO 3	Assignment
Week 9	Web and Database Hacking	CLO 3, CLO 5	Quiz 2 (5%) 6th April, break time
Week 10	Web and Database Hacking	CLO 3, CLO 5	
Week 11	Social Engineering	CLO 3, CLO 5	Assignment
Week 12-13	Sniffing and DoS attacks	CLO 3, CLO 4, CLO 5	Assignment
Week 14	Wireless Networks hacking	CLO 3, CLO 5	Major 2 (15%) 27 April 2026 Assignment
Week 15	Case studies + Students' projects	CLO 1, CLO 2, CLO 5	Project Submission Presentation (15%)

8. Weight of Assessments

Assessment	Assessment Task	Week Due	Proportion of Final Assessment
1	Midterms	7 th and 14 th week	25% (M1=10%, M2=15%)
2	Quizzes	4 th and 9 th week	10%
3	Assignment/Class Practice	Throughout semester	10%
4	Attendance	Throughout semester	5%



5	Project	Week 15	10%
6	Final exam	End of Semester	40%

9. Additional Information

Plagiarism and Academic Dishonesty: “Plagiarism can be defined as unintentionally or deliberately using another person’s writing or ideas as though they are one’s own. Plagiarism includes, but is not limited to, copying another individual’s work and taking credit for it, paraphrasing information from a source without proper documentation, and mixing one’s own words with those of another author without attribution. In addition, buying a paper or project, or downloading a paper from the Internet, and submitting them as your own are also plagiarism. The penalty for academic dishonesty will bring course expulsion and failure, or even suspension” (Academic Integrity and Syllabus Acknowledgement Form).

Attendance Policies: The University attendance policy will be strictly followed. Students are expected to attend all class sessions and be in class on-time. Missing a class session is a student’s responsibility. Missed classes will not be repeated. **A total of 16 absences may lead to denial grade DN.** It is the student’s responsibility to periodically check course website/Moodle for course content, projects assignments, updates and notifications.

Attendance Marks will be computed according to the following table:

Number of absences	3 or less	4	7	10	13	15
Deducted Mark out of 5	0	1	2	3	4	5