



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:** CYS406, Data and Network Security
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. Basmh Alkanjr
 - a. **Scheduled Office Hours:** Sun, Mon, Tue, 12:00-12:45 pm , Wed, 10:00-10:50 pm & 12:00-12:50
 - b. **Office Location:** , Office: W311
 - c. **Email:** Balkanjr@psu.edu.sa
4. **Text book, title, author, and year**
 - . **Primary Text:**
 - NDE “Network Defense Essentials” EC-Council
 - CNDV2 “Certified Network Defender” EC-Council
 - Network Security Essentials Applications and Standards, 7/E William Stallings, ISBN-10: 0133370437 • ISBN-13: 9780133370430©2017 • Prentice Hall • Paper, 448 pp
 - a. **Other References:**
 - Network Security Assessment, 3rd Edition By: Chris McNab Publisher: O'Reilly Print: November 2016 Ebook: February 2016 Pages:508 ISBN:978-0-596-10278-4ISBN 10:0-596-10278-X.
 - Network Security Hacks, 2nd Edition by: Andrew Lockhart Publisher: O'Reilly Pages:480 ISBN:978-0-596-10256-2| ISBN 10:0-596-10256-9
- b. **Course Website [Optional]:**
 - c. **Learning Management System:** Moodle available at <https://lms.psu.edu.sa>
5. **Specific course information**
 - . **Brief description of the content of the course (catalog description):** This course serves as a defensive techniques course to the Cybersecurity track whereby the data and network security defending methods are discussed. This course concentrates on computer and network defense and countermeasures by providing a solid foundation in advanced network and data security fundamentals. Topics to be covered include cryptography and network security controls.
 - a. **Prerequisites or co-requisites:** CS331, CYS401
 - b. **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

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

CLO1: Demonstrate the knowledge and understanding of data and

network security needed in data communication with various possible threats and attacks

CLO2: Analyze the network security models and approaches for specific security needs based on security protocols and controls

CLO3: Apply various technical network defense controls including network segmentation, firewall, IDS/IPS, honeypot, proxy server, VPN, SIEM, UBA, and anti-malware.

CLO4: Develop hands-on expertise and depth technical knowledge to perform real-life network defense situations.

CLO5: Distinguish the network security principles in terms of their legal, ethical and professional aspects.

a. 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	Information Science
1	1	1	1
2	6	6	6
3	6	6	6
4	6	6	6
5	4	4	4

7. Brief list of topics to be covered

Week No.	Topics	CLO(s) alignment	Assessments
1	Network Security Fundamentals - Network Threats/Attacks - Network Defenses	CLO1, CLO5	Lab Assignment
2	Authentication, Identification and Authorization	CLO1	Lab Assignment
3-4	Cryptography Fundamentals and Algorithms - Symmetric Cryptography (DES, 3DES, AES, RC4) - Asymmetric Cryptography (RSA, ECC) - Hash Functions (SHA1)	CLO2, CLO 3	Lab Assignment Quiz 1(5%)
5-6	Applications of Cryptography - Digital Signature - Digital Certificate - Public Key Infrastructure	CLO3, CLO 4	Lab Assignment
7	Network Security Protocols - RADIUS - TACACS+ - Kerberos - PGP, HTTPS, TLS/SSL, IPsec	CLO2	Lab Assignment Major 1 (10%) 4 th Feb 2026 @ 12:00 PM
8-9	Network Security Controls-Part 1 - Network Segmentation (subnets, ACL) - Firewalls and their role	CLO3	Lab Assignment Quiz 1(5%)

	- IDS/IPS and their role		
Eid Al-Fitr Holiday weeks 10-14 18 February- 29 March			
15	Network Security Controls-Part 1 (continuation) - Network Segmentation (subnets, ACL) - Firewalls and their role - IDS/IPS and their role	CLO3	Lab Assignment
16-17	Network Security Controls -Part 2 - Honeypots - Proxy servers and their benefits - Fundamentals of VPN and its importance	CLO 3	Lab Assignment
18	Network Security Controls -Part 3 - Security Incident and Event Management (SIEM) - User Behavior Analytics (UBA) - Network Monitoring	CLO 3	Lab Assignment Major 2(15%) 22nd April 2026 @ 12:00 PM
19	Data Security - Data security and its importance - Various Security controls for Data encryption - Back up and retention - Data loss prevention concepts	CLO 3, CLO 4	Lab Assignment
20	Student Projects	CLO1-CLO5	Project-Presentation Submissions (10%)

8. Weight of Assessments

Assessment	Weightage	Date	Time
Quiz 1	5%	Week 4	12 to 1 (breaktime)
Major 1	10%	Week 7	12 to 1 OR 5 to 6
Quiz 2	5%	Week 9	12 to 1 (breaktime)
Major 2	15%	Week 17	12 to 1 OR 5 to 6
Labs/Tutorials	10%	throughout the semester	
Attendance	5%	Entire semester	
Project report & presentations	10%	Week 20	During class time
Final Exam	40%		