Jordan University of Science and Technology

Faculty of Computer & Information Technology

Network Engineering And Security Department

NES750 Advanced Network Security - JNQF Level: 9
First Semester 2023-2024

Course Catalog
3 Credit Hours. This course covers advanced aspects of network security. Topics include: historical and recent network-based attacks including denial of service attacks, DNS Security, Intrusion Detection and Prevention Systems; Advanced firewall considerations; Network cryptographic protocols (IPsec), Key distribution and Management protocols (IKE), web security, and contemporary network security topics.
Teaching Method: Blended

Text Book	
Title	Network Security: Private Communication in a Public World
Author(s)	Kaufman, Perlman, and Speciner
Edition	2nd Edition
Short Name	Ref #1
Other Information	rentice Hall PTR, 2002, ISBN 0130460192.

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Course notes (slides, papers, ...)	Others	1st Edition	Available on the E-learning

Instructor	
Name	**Prof. Mohammad Al-Shurman**
Office Location	E1L3
Office Hours	Sun : 11:00 - 12:00 Mon : 11:30 - 13:30 Tue : 11:30 - 13:00 Wed : 11:30 - 13:00
Email	alshurman@just.edu.jo

Class Schedule & Room
Section 2: Lecture Time: Sun : 12:00 - 13:30 Room: NES01-E1L3

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Course Overview and Introduction to Network Security	From **Ref #1**
Weeks 2, 3	Firewalls	From **Ref #1**, From **Ref #2**
Weeks 4, 5	Intrusion Detection Systems	From **Ref #2**
Weeks 6, 7	DDoS Attacks and Mitigation	From **Ref #1**, From **Ref #2**
Weeks 8, 9	DNS Security Routing Protocol Security (BGP)	From **Ref #1**, From **Ref #2**
Weeks 10, 11	Email Security	From **Ref #2**
Weeks 12, 13	IPSec	From **Ref #2**
Weeks 15, 16	New Trends in Computer Security	From **Ref #2**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand current attacks and and defenses against networked Computers [1MSO2] [1L9K2]	25%	Midterm Exam, Labs and Homeworks, Final Written exam
Investigate contemporary network security trends [1MSO2] [1L9S1]	25%	Labs and Homeworks, Final Written exam
Conduct a research on a topic the student chooses related to computer security [1MSO6] [1L9C1]	50%	Project Proposal, Project Progress, Draft Report, Reviews, Final Report, Final Presentation

Relationship to Program Student Outcomes (Out of 100%)													
SO1	SO2	SO3	SO4	SO5	SO6	SO7	MSO1	MSO2	MSO3	MSO4	MSO5	MSO6	MSO7
								50				50	

Relationship to NQF Outcomes (Out of 100%)		
L9K2	L9S1	L9C1
25	25	50

Evaluation	
Assessment Tool	**Weight**
Midterm Exam	15%
Labs and Homeworks	20%
Final Written exam	15%
Project Proposal	5%
Project Progress	5%
Draft Report	10%
Reviews	5%
Final Report	15%
Final Presentation	10%

Policy	
50% Research paper and presentation	The purpose of the research paper and presentation is to expose you to recent research in network security. The report will demonstrate the depth of your understanding of a chosen area of Network Secure. You will write a paper/conduct experiments that investigates recent research on the topic. The paper should be at least 10 pages long (excluding the reference list), and written using 11 or 12 point type, single-spaced, with 1 inch or 1.25 inch side margins and 1 inch top/bottom margins. You must cite the work you reference appropriately and include a bibliography (or references section) that is formatted in a reasonable way. If you find a paper on the Web that you believe to have been published in a conference proceedings or journal, you must cite the conference proceedings or journal, not the Web page. Your paper must cite at least 20 papers total. The paper should investigate in one of predefined ideas that covers a new way to think about the problem or a new design that might be an improvement of an existing ideas in the literature. It should discuss the research contributions have been made in enough detail that a reader who has completed this course is likely to understand the central ideas. The paper should analyze your results and try to integrate those ideas into a coherent summary of current state of the art and directions for future research. [Date to be determined]You are required to submit a short (1/2 page) summary of exactly which topic you choose. Your half page summary should describe how you will limit or expand the scope of your paper. You will need to have looked at a number of relevant articles in order to see what interests you and what collection of articles would be a good basis for a coherent research report
20% Homeworks and practical labs Labs	There will be online lab exercises. The lab exercises are graded on a scale between[0, 2], where 1 is given for attendance and 2 is given for completion. A good attempt should count as a passing grade. Missed labs may be graded within the same week during my office hours (or convenience). To ensure your understanding, make-up lab evaluation may take the form of a short oral evaluation.
30% Exams	You will have one midterm and one cumulative final (with a strong emphasis on the materials covered after the midterm). Exams will take place according to the department official exam schedules. 15% Midterm |Exam 15% Final Exam