Information Security

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Spring 2015
Wednesdays 10:00am - 12:50pm, 1 Washington Park, Room 308

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Course Description: Recent years have witnessed widespread use of computers and their interconnecting networks. This demands additional computer security measures to protect the information and relevant systems. This course prepares the students to meet the new challenges in the world of increasing threats to computer security by providing them with an understanding of the various threats and countermeasures. Specifically, students will learn the theoretical advancements in information security, state-of-the-art techniques, standards and best practices. In particular, the topics covered in this course include: Study of security policies, models and mechanisms for secrecy, integrity and availability; Operating system models and mechanisms for mandatory and discretionary controls; Data models, concepts and mechanisms for database security; Basic cryptology and its applications; Security in computer networks, emerging applications and smart devices; Identity theft; Control and prevention of viruses and other rogue programs.

Text Book: There is no prescribed text.

Reference Books:

2. Matthew Bishop, Introduction to Computer Security, Addison-Wesley
4. Plus selected readings

Other sources:

1. The DBLP Bibliography An Excellent source for the Research materials in the Database area
2. Google Scholar

Related Journals and Conferences:
1. ACM Conference on Computer and Communications Security (CCS)
2. IEEE Symposium on Security and Privacy (S&P)
3. ACM Symposium on Access Control Models and Technologies (SACMAT)
4. IFIP WG11.3 Working Conference on Data and Application Security (DBSEC)
5. Annual Computer Security Applications Conference (ACSAC)
7. ACM Transactions on Information Systems Security (TISSEC)
8. IEEE Transactions on Dependable and Secure Systems (TDSC)
9. Journal of Computer Security
10. Computers and Security

Expected Work:

Research Paper and Presentation 30%
Mid term Examination 25%
Final Examination 25%
Homeworks 20%

Tentative Schedule:

Jan 21
Basic Security Concepts, Introduction to Cryptography, Secret Key and Public Key Cryptography

Jan 28
Introduction to Cryptography, Secret Key and Public Key Cryptography (continued)

Feb 4
Digital Signatures and Certificates
Research Paper Title and Outline due
Homework 1 posted

Feb 11
No Class

Feb 18
Identification and Authentication
Homework 1 Due

Feb 25
Internet Security

Mar 4
Security Models

Mar 11
Mid-term examination (Topics covered until Feb 25)

Mar 25
Security Models (Continued)
Homework 2 posted

Apr 1
Database Security
Homework 2 Due

Apr 8
Database Security
Research Paper Due

Apr 15
Research Paper Presentations: Each student will have 20 minutes to present
Topics for the Research paper include:

1. Best Source: The session topics in the conferences listed above
3. Identify Management
4. Role Mining
5. Security for Smart Devices
6. Security for Social Networks
7. Big Data Security
8. Security for Digital Money
9. Inference Control
10. Security in Electronic Commerce
11. Security in WWW
12. Security for Mobile Systems
14. Intrusion Detection
15. Security for Web services
16. Biometrics
17. Security of Statistical Databases
18. Viruses
19. Computer Ethics
20. Spam and Phishing
21. Identity theft
22. .....