MSDS 7349
Data and Network Security

Daniel W. Engels, PhD

I. Welcome to MSDS 7349

WELCOME to MSDS 7349, Data and Network Security. The objective of this document is to acquaint you with the administration, procedures, and policies of this course. Save this document for future reference.

II. Professor Contact Information

Professor:	Daniel W. Engels, PhD
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Email:	dwe@smu.edu
Office Hours:	As posted and by appointment

The best way to contact Dr. Engels is via text message to his cell phone. Emails are an unreliable communication medium and should be assumed to be not received unless a response is sent from Dr. Engels.

III. Description of Course Content

MSDS 7349 is designed to introduce students to the foundations of cyber security with an emphasis on the fundamental topics including symmetric key cryptography, modes of operation, public key cryptography, cryptographic hash functions, authentication, digital signatures, and the foundation of security, trust. In addition, this course introduces privacy and examines the ethics involved in cyber security. This is not a course on security management or configuration, though these topics are discussed. No prior cyber security experience is assumed.

IV. A/Synchronous Sessions

Synchronous class sessions occur weekly during the course of the term. These sessions will consist of lectures, discussions, problem solving and quizzes based on the Asynchronous material and any readings from the literature assigned for that week. It is expected that the Asynchronous material will be viewed and readings completed prior to the Synchronous session.

V. Course Prerequisite

A student taking MSDS 7349 must be enrolled in the DataScience@SMU program.

Dr. Engels is an Associate Professor in the Department of Computer Science and Engineering, Southern Methodist University. He may be reached at dwe@smu.edu or +1-817-676-1031 or by visiting his office at 461 Caruth.

VI. Required Textbook and Other Course Material

The required textbook for this course is:

> William Stallings, *Cryptography and Network Security: Principles and Practice,* 6th edition, 2014, Pearson. ISBN-13: 978-0-13-335469-0

VII. Course Topic Summary

Table I lists the basic topics covered during each week of this course. Additional readings may be given during the course.

TABLE I
Topic Summary for Each Week of Course

Week/ Unit	Topic	Readings
1	Introduction to Data and Network Security	Stallings Ch.1
2	Computer Networks	
3	Symmetric Key Cryptography	Stallings Ch.2-3
4	Using Symmetric Key Ciphers	Stallings Ch.3,6
5	Randomness and Pseudorandom Numbers	Stallings Ch.7
6	Public Key Cryptography	Stallings Ch.9-10
7	Hash Functions	Stallings Ch.11
8	Message Authentication Codes	Stallings Ch.12
9	Midterm Exam	
10	Key Management and Key Distribution	Stallings Ch.14
11	User Authentication	Stallings Ch.15
12	Network Security	Stallings Ch.17
13	Privacy	
14	Security Ethics	
15	Final Exam/Final Project Presentations	

VIII. Student Learning Outcomes

This course provides an introduction to security for data and network systems. The primary goal of this course is to teach students the foundational concepts and tools of security systems. As such, the primary learning outcomes for this course are:

1) An ability to evaluate potential cyber security risks.
2) An ability to evaluate the suitability of cyber security mechanisms.
3) An ability to design and evaluate a secure system.

The general learning outcomes for the department degree programs are supported within this course. Through the various activities associated with this course, we will, to a greater or lesser degree, achieve the following departmental learning outcomes:

1) An ability to apply knowledge of mathematics, science and engineering to software and hardware design problems.
2) An ability to design and conduct experiments and to analyze and interpret data related to software and hardware design solutions.
3) An ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4) An ability to function on multidisciplinary teams using current computer engineering tools and technologies.
5) An ability to identify, formulate and solve engineering problems based on a fundamental understanding of concepts of computer engineering topics.
6) An understanding of personal, professional and ethical responsibility.
7) An ability to communicate effectively both in an oral and written form.
8) The broad liberal arts education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
9) Recognition of the need for, and an ability to engage, in lifelong learning.
10) Knowledge of contemporary issues in computer engineering.
11) An ability to use the techniques, skills and modern engineering tools necessary for computer engineering practice.

IX. Description of Course Procedures and Policies

This course, like all courses, has a number of policies and procedures that students should understand and follow if appropriate. This section lists some of the more important policies and procedures that students must follow. Additional policies and procedures may be given by the instructor.

A. Grading Policy

This course consists of weekly asynchronous teaching material, once weekly synchronous sessions, Quizzes, Homework Assignments, a Midterm Exam, a Final Exam, and a Term Project. It is expected that not all students will put forth the effort required to earn an 'A' letter grade for this course.

The final grade for the course will be calculated on the bases of the earned cumulative percentage and the grade received for each of the components of the cumulative percentage. This course is not graded on a curve. The required cumulative percentage needed to earn each letter grade is given in Table II. The instructor reserves the right to lower these standards for the benefits of the students if such a change is warranted.

The cumulative percentage for the course is determined by the components with their corresponding percentages defined in Table III.

*You will receive a percentage grade for each component. If you earn less than 60% in any one of these components, you will receive a final grade of F for this course. This means that you must perform the term project to at least a 60% (grade of D-) level of proficiency, you must earn at least 60% on the midterm exam and on the final exam, and you must earn at least a 60% for your homework assignments and quizzes.

TABLE II
Cumulative Percentage Required To Earn Each Letter Grade

Cumulative Percentage	Earned Grade
100 – 92	A
92 – 90	A-
90 – 88	B+
88 – 82	B
82 – 80	B-
80 – 78	C+
78 – 72	C
72 – 70	C-
70 – 68	D+
68 – 62	D
62 – 60	D-
< 60	F*

TABLE III
Components and Weightings of the Cumulative Percentage

Percentage of Cumulative Percentage	Component
5%	Weekly Participation
25%	Quizzes/Homework
40%	Term Project
15%	Midterm
15%	Final Exam

B. Grade Grievance Policy

Students are responsible for saving all graded materials as evidence in case of a discrepancy with the assigned grades. Students are responsible for ensuring that all grades are correctly reflected on the grade store.

Refer to the university catalogue for the university policy and process for grade grievances.

C. Attendance Policy

Attendance of the synchronous session in this course is mandatory. Either a Quiz or a Participation Grade will be given during each lecture period. Students with an unexcused absence will receive a grade of zero (0) for the Quiz or Participation Grade for any missed day. Students with an excused absence will receive a grade equal to the average of the grades received by students who attended the missed lecture session.

D. Homework Policy

Homework assignments may be performed individually or in a group. Each student must hand in a homework assignment unless otherwise directed by the homework instructions. If you work on an assignment with other people, you must indicate on your handed in solution the names of all people with whom you worked. Identical and suspiciously similar homework papers will receive a grade of zero if the collaboration list

on each of the homework papers does not include the authors of the identical or suspiciously similar homework papers.

To receive full credit, all directions must be followed. It is therefore important to read the written directions on the homework assignment and listen and follow any oral directions given by the instructor.

All homework submitted after the deadline will receive a 50% reduction in the earned grade for that assignment.

E. Electronic Communication Policy

All communications with the professor should be made in person. When that is not possible, then communication should be attempted by calling or texting his telephone number.

All communications with the teaching assistants for the course (if there are any teaching assistants) should be made in person. When that is not possible, then email.

It is the student's responsibility to ensure that all communications from the student to either the professor or the teaching assistants are received, acknowledged, and, when appropriate, acted upon in a timely manner. Simply sending an email or text or leaving a voicemail does not guarantee that it has been received or acted upon.

F. Drop Policy

Refer to the university drop policy for a complete description.

G. Americans With Disabilities Act

Disability Accommodations: Students needing academic accommodations for a disability must first be registered with Disability Accommodations & Success Strategies (DASS) to verify the disability and to establish eligibility for accommodations. Students may call 214- 768-1470 or visit http://www.smu.edu/alec/dass to begin the process. Once registered, students should then schedule an appointment with the professor to make appropriate arrangements. (See University Policy No. 2.4.)

H. Religious Observance

Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with him, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.) Failure to notify your professor prior to your absence will result in an unexcused absence and possibly a grade of zero for any assignments.

I. Excused Absences for University Extracurricular Activities

Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work.

X. Academic Integrity

It is the philosophy of Southern Methodist University that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Students caught being academically dishonest shall receive a grade of F for this course.