INSTRUCTOR & COURSE INFORMATION

This syllabus describes the requirements and procedures for CSci 389 (Computer and Network Security). You are responsible for knowing the course requirements specified in this syllabus, so please read carefully. Any changes will be announced in class/email/Blackboard Announcement. You will be responsible for any changes. Your continued enrollment in this course is your implicit agreement to abide by the requirements of this class.

Professor / Instructor Contact Information

Name: Dr. Jun Liu
Phone: 701-777-4982
Email: jun.liu@und.edu
Office Location: Room 366H, Upson II.
Office Hours: 12:30pm-2:00pm Tuesday or Thursday, or by individual appointments.

Course Description & Objectives

This is an undergraduate course on methods of securing computer systems and network information systems. This course discusses fundamental concepts in the following areas:

- Cryptography background and concepts.
- The underlying algorithm used for encryption and decryption: hash functions, public/private key encryption, and block ciphers.
- Security Issues and attack on real-world Systems, the potential vulnerabilities of the encryption algorithm.
- Public key infrastructures.
- Key exchange, key management, and policy management.
- Use of encryption algorithms for authentication and information integrity.
- A few representative security protocols which are designed based on cryptography.

Learning Objectives

The learning objectives of this course include:

1) Learning the basic concepts of cybersecurity.
2) Understanding the idea that cryptography is one of the basic building blocks of cybersecurity.

UNIVERSITY OF NORTH DAKOTA.

3) Learning the two essential cryptographic approaches: symmetric cryptography and asymmetric cryptography.
4) Learning some necessary mathematical methods used in the cryptographic designs.
5) Learning the basic ideas and designs of some representative cryptographic methods.
6) Learning the basic ideas of some cryptanalytic methods.
7) Learning the applications of representative cryptographic methods toward the construction of cybersecurity protocols.

Materials – Text, Readings, Supplementary Readings

Required Textbook:

Title: Cryptography and Network Security.
Edition: 8th Edition (not the Global Edition)
Author: William Stallings
Year of Publication: 2023
Publisher: Pearson
ISBN-10: 1292437480
ISBN-13: 9781292437484

Recommended Textbook: (Not required to buy, but highly recommended to read)

Title: Hacking Cryptography: Write, break, and fix real-world implementations
Version: Manning Early Access Program (MEAP) Edition Version 9
Authors: Kamran Khan & Bill Cox
Year of Publication: 2024
Publisher: Manning Publications

Code listings and exercise solutions are available publicly at the GitHub repository at https://github.com/krkhan/crypto-impl-exploit.

Technical Requirements/Assistance

You will use Microsoft Word to complete assignments (or to directly make answers in Blackboard). Students are expected to use their official UND email in the course. Visit the Office 365 Email webpage for information on your UND email and how to download/install a free version of Microsoft Office. For technical assistance, please contact UND Technical Support at 701.777.2222. Visit the University Information Technologies (UIT) website for their hours, help documents and other resources.

UNIVERSITY OF
NORTH DAKOTA.

CSci 389
(Computer and Network Security)
Spring 2025
Hybrid On campus and online
2:00pm—3:15pm Tuesday and Thursday, Harrington 218

Minimum Technical Skills Needed:

To succeed in this course, at a minimum, you should be able to:
- Access to the Internet;
- Use Web browser, Blackboard, and Zoom;
- Send, receive, and manage emails;
- Use Microsoft Words and Powerpoint applications.

Course Logistics

Access and Log in Information

This course was developed and will be facilitated utilizing Blackboard. To get started with the course, please go to: http://blackboard.UND.edu and log in with your NDUS.Identifier, Username and Password. If you do not know your NDUS Identifier or have forgotten your password, please visit Your NDUS Account page on the UIT website.

Course Overview

The course content is organized into 17 weeks for Spring semester. Each week contains a purpose, learning outcomes, and a variety of links to articles, and other instructional resources selected to enhance the learning experience and support the various topics. Discussions, blogs, wikis, surveys, quizzes, tests and assignments will be used to assess your comprehension and application of those materials.

What Should Students Do First?

Prior to the start of the first week you should have reviewed the syllabus and have taken the Syllabus Quiz.

Instruction Style

This course adopts flipped instruction. Weekly learning modules will be posted to allow students to study the course materials planned to accomplish in each week. Clear instructions on textbook reading, assignments/activities/assessments and their due dates will be specified in weekly learning modules.

How Students Should Proceed Each Week for Class Activities?

On the left side course menu in Blackboard there is a "Learning Modules" tab. Inside Learning Modules you will find all the required readings, videos, and assignments/activities for the week. An overview of

UNIVERSITY OF
NORTH DAKOTA.

each week can be found in Blackboard under the Schedule tab.

Resources

Many services are available to online students such as writing assistance from the UND Writing Center, free online tutoring from Smarthinking, and more. Visit the Student Resources page for more information. Students also have access to the UND Student Resource Site via Blackboard. It is recommended that you become familiar with the tools and tutorials within the site to better equip you in navigating the course.

Course Requirements/Expectations

1. Students will review the syllabus and course schedule posted in Blackboard.
2. Students will access and follow all course instructions found in the weekly area of the Blackboard course.
3. Students will complete and submit assignments, exams, quizzes, etc. by the dated noted in Blackboard and on the course schedule. **We will use Central Standard Time for due dates and times.**
4. Student will participate fully and in a timely manner to get the benefit of learning from instructor and/or peers.

Communication

Announcements

Announcements will be posted in Blackboard on a regular basis. Be sure to check the class announcements regularly as they will contain important information about class assignments and other class matters.

Email

You are encouraged to post your questions about the course in the course discussion board forum in the Blackboard site. This is an open forum in which you and your classmates are encouraged to answer each other's questions. But, if you need to contact me directly, check the Faculty tab in Blackboard or

UNIVERSITY OF
NORTH DAKOTA.

the syllabus for my contact information. I will respond back to you within 48 hours during the week or weekend.

Discussion Forums, Blogs, & Wikis

These tools are an excellent way for you to engage with the course material and with your peers. Each week we will have at least one of these tools for you to participate in.

Etiquette

When participating in (an online) class it is important to interact with your peers in an appropriate manner. Always use professional language (no netspeak) in your postings and emails. Please be respectful to your classmates at all times even if you disagree with their ideas.

Assessment & Grading

This course is made up of a series of quizzes, assignments and assessments to assist you in achieving the course learning objectives/outcomes.

Assessments

In this course your learning will be assessed in the following ways: [list and explain the assessments used in the course, some examples are show below]

Introduce Yourself Blog

Introduce yourself in the Week 1: Introduce Yourself blog. Include your name, something about yourself, and an optional photo. The Introduce Yourself Blog is due on 08/23/2022 and worth 5 points.

Mid-Term Test 1

Mid-term test #1 will take place in Week 4 and will cover Chapters 1-3. Chapter 2 is partially covered on Sec. 2.1-2.4. To prepare for the exam make sure to have read all the assigned readings, watched the recorded lectures, and have reviewed the provided study guide. The exam is worth 15% of the overall score. This test will be offer to both the on-campus and online sessions. The on-campus session uses Zoom proctoring with the instructor. The online session uses ProctorU Live+ proctoring. On-campus students cannot use ProctorU Live+ proctoring. Online students can take the test with the on-campus

session.

Mid-Term Test 2

Mid-term test #2 will take place in Week 9 and will cover Chapters 4-8. To prepare for the exam make sure to have read all of the assigned readings, watched the recorded lectures, and reviewed the provided study guide. The exam is worth 15% of the final score. This test will be offer to both the on-campus and online sessions. The on-campus session uses Zoom proctoring with the instructor. The online session uses ProctorU Live+ proctoring. On-campus students cannot use ProctorU Live+ proctoring. Online students can take the test with the on-campus session.

Quizzes

The course includes several Blackboard quizzes that will make up 15% of your final grade. Quizzes include:
- Syllabus Quiz [due on 01/13/2022, by midnight]
- Weekly Reading Quizzes [due on Fridays, by midnight]

Weekly Reflections

At the end of a week you will be required to complete a weekly reflection where you will be asked to identify what you learned that week and what you still have questions about. Weekly reflections are not required for the week when a mid-term test or the final exam is scheduled to happen.

Final Exam

The final exam is a comprehensive exam and will take place according to the exam schedule arranged by the Registrar's office. 40% and 60% of the total points in the final exam cover the materials before and after mid-term test #2, respectively. To prepare for the exam make sure to have read all the assigned readings, watched the recorded lectures, and have reviewed the provided study guide. The exam is worth 25% of the final score. This test will be offer to both the on-campus and online sessions. The on-campus session uses Zoom proctoring with the instructor. The online session uses ProctorU Live+ proctoring. On-campus students cannot use ProctorU Live+ proctoring. Online students can take the test with the on-campus session.

Grading Policy

Course evaluation includes written assignments, course interactions, quizzes, two mid-term tests, and a final exam. The final exam is weighted comprehensive with 40% and 60% of the points covering the materials before and after the midterm test #2, respectively. No make-up tests are offered.

The weights of the four components towards the final grade are:
- **Written Assignments: 30%**
- **Course Interactions (Blogs and Weekly Reflections): 10%**
- **Quizzes: 20%**
- **Mid-Term Test #1: 10%**
- **Mid-Term Test #2: 10%**
- **Final Exam: 20%**

Grading Breakdown

Grading Scale	Breakdown of Weighted Totals
A 90% to 100% B 80% to 89.99% C 70% to 79.99% D 60% to 69.99% F below 60%	[Blogs and Reflections – 10%] [Quizzes – 20%] [2 Mid-Term Tests – 20% (10% each)] [Assignments – 30%] [Final Exam – 20%]

Course Evaluation

Around the middle of the semester, we will complete a formative assessment to see how the course is going. Near the end of the semester, you will be asked to complete an online course evaluation form (SELFI). Your feedback on the course is extremely valuable to me. I read my students' comments carefully and use them to improve the course the next time I teach it.

- When the time comes, please let me know which aspects of the course helped you learn—and which aspects might be modified to help future students learn more effectively.
- Please note that the course evaluations are anonymous and that I won't see the results until after the grades for the course are submitted, allowing you to provide honest and constructive feedback.
- And if you have feedback to offer before the end of the semester, please let me know.

Course Schedules

			Module

Week	Dates	
Week 1	01/13 – 01/17	Course Organization Chapter 1: Introduction to Data Communications and Modern Internet
Week 2	01/20 – 01/24	Chapter 2: Introduction to Number Theory (Part 1: Sec 2.1-2.4)
Week 3	01/27 – 01/31	Chapter 3: Classical Encryption Techniques
Week 4	02/03 – 02/07	Review for Mid-Term Test #1 and the test (The test is scheduled to happen in class on 02/06)
Week 5	02/10 – 02/14	Chapter 4: Block Ciphers and the Data Encryption Standard
Week 6	02/17 – 02/21	Chapter 5: Finite Fields
Week 7	02/24 – 02/28	Chapter 6: Advanced Encryption Standard Chapter 7: Block Cipher Operation
Week 8	03/03 – 03/07	Chapter 8: Random Bit Generation and Stream Ciphers
Week 9	03/10 – 03/14	Spring Break (No Classes)
Week 10	03/17 – 03/21	Review for Mid-Term Test #2 (The test is scheduled to happen in class on 03/20)
Week 11	03/24 – 03/28	Chapter 2: Introduction to Number Theory (Part 2: Sec 2.5-2.9)
Week 12	03/31 – 04/04	Chapter 9: Public-Key Cryptography and RSA Chapter 10: Other Public-Key Cryptosystems
Week 13	04/07 – 04/11	Chapter 11: Cryptographic Hash Functions Chapter 12: Message Authentication Codes
Week 14	04/14 – 04/18	Chapter 13: Digital Signatures Chapter 14: Key Management and Distribution
Week 15	04/21 – 04/25	Chapter 15: User Authentication Chapter 16: Network Access Control and Cloud Security
Week 16	04/28 – 05/02	Chapter 17: Transport-Level Security Chapter 20: IP Security
Week 17	05/05 – 05/09	Review for Final Exam
Week 18	05/12 – 05/16	Final Exam (05/15/2025, Thursday, 1:00PM - 3:00PM, Harrington Hall, Room 218)

Course Policies

Assignment Policy

Due dates for each assignment or activity will be posted in Blackboard.

Late Work

All assignments must be submitted by the due dates posted in the course. The acceptance of late assignments is at the discretion of the instructor, provided that you contact the instructor before the due date and ask for an extension. All requirements for this course must be completed during the course dates.

Instructor Responsibilities and Feedback
- The instructor will provide feedback on all assignments and group activities within one week following their due dates.
- The instructor will be available during appointed Office Hours to answer questions, provide feedback, and offer advice.

Class Participation
Students are required to login regularly to the online class site. Students are also required to participate in all class activities such as discussion board and blogs.

Incompletes
It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student's control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark "I," Incomplete, will be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor. More information regarding UND's Incomplete policy can be found on [The Grading System webpage](#).

UNIVERSITY OF NORTH DAKOTA POLICIES & RESOURCES

Academic Integrity
Academic integrity is a serious matter, and any deviations from appropriate behavior will be dealt with strongly. At the discretion of the professor, situations of concern may be dealt with as a scholastic matter or a disciplinary matter.

As a scholastic matter, the professor has the discretion to determine appropriate penalties to the student's workload or grade, but the situation may be resolved without involving many individuals. An alternative is to

treat the situation as a disciplinary matter, which can result in suspension from the University, or have lesser penalties. Be aware that I view this as a very serious matter, and will have little tolerance of or sympathy for questionable practices. A student who attempts to obtain credit for work that is not their own (whether that be on a paper, quiz, homework assignment, exam, etc.) will likely receive a failing grade for that item of work, and at the professor's discretion, may also receive a failing grade in the course. For more information read the Code of Student Life.

Access & Opportunity, Disability Support and Medical Services

If you have emergency medical information to share with me, or if you need accommodations in this course because of a disability, please visit with me as soon as possible. My office hours are at the top of this syllabus. If you plan to request disability accommodations, you are expected to register with the Disability Support Services (DSS) office online, (180 McCannel Hall, 701.777.3425).

If you have a temporary medical condition such as a broken arm or recovering after surgery, you may be able to arrange for courtesy services. In most cases, it is expected that you will make your own arrangements for these services. Examples of courtesy services include access to a test scribe if the student has a broken hand; lift equipped van transportation when the student has a broken leg or temporary accessible parking for a student using crutches for a short period. If you are unable to make your own arrangements, please contact DSS (777-3425). Unlike services and/or accommodations provided to eligible students with disabilities, the University is NOT obligated to provide courtesy services.

Resolution of Problems

Should a problem occur, you should speak to your instructor first. If the problem continues to be unresolved, go to the department chair, and next to the college Dean. Should the problem persist, you have the right to go to the Provost next, and then to the President.

Notice of Nondiscrimination

It is the policy of the University of North Dakota that no person shall be discriminated against because of race, religion, age, color, gender, disability, national origin, creed, sexual orientation, gender identity, genetic information, marital status, veteran's status, or political belief or affiliation and the equal opportunity and access to facilities shall be available to all. Concerns regarding Title IX, Title VI, Title VII, ADA, and Section 504 may be addressed to: Donna Smith, Director of Equal Employment Opportunity/Affirmative Action and Title IX Coordinator, 401 Twamley Hall, 701.777.4171, UND.affirmativeactionoffice@UND.edu or the Office for Civil Rights, U.S. Dept. of Education, 500 West Madison, Suite 1475, Chicago, IL 60611 or any other federal agency.

UNIVERSITY OF NORTH DAKOTA.

Reporting of Sexual Violence

If you or a friend has experienced sexual violence, such as sexual assault, domestic violence, dating violence or stalking, or sex-based harassment, please contact UND's Title IX Coordinator, Donna Smith, for assistance: 701.777.4171; donna.smith@UND.edu; or visit the [Title IX webpage](#).

Faculty Reporting Obligations Regarding Sexual Violence

It is important for students to understand that faculty are required to share with UND's Title IX Coordinator any incidents of sexual violence they become aware of, even if those incidents occurred in the past or are disclosed as part of a class assignment. This does not mean an investigation will occur if the student does not want that, but it does allow UND to provide resources to help the student continue to be successful at UND. If you have been the victim of sexual violence, you can find information about confidential support services on the [Title IX webpage](#).

UND Cares Program

The [UND Cares program](#) seeks to educate faculty, staff and students on how to recognize warning signs that indicate a student is in distress.

How to Seek Help When in Distress

We know that while college is a wonderful time for most students, some students may struggle. You may experience students in distress on campus, in your classroom, in your home, and within residence halls. Distressed students may initially seek assistance from faculty, staff members, their parents, and other students. In addition to the support we can provide to each other, there are also professional support services available to students through the Dean of Students and University Counseling Center. Both staffs are available to consult with you about getting help or providing a friend with the help that he or she may need. For more additional information, please visit the [UND Cares program Webpage](#).

How to Recognize When a Student is in Distress

The term "distressed" can mean any of the following:

- Student has significant changes in eating, sleeping, grooming, spending, or other daily activities.
- Student has cut off or minimized contact with family or friends.
- Student has significant changes in performance or involvement in academics, sports, extracurricular, or social activities.
- Student describes problems (missing class, not remembering, destructive behavior) that result from experiences with drinking or drugs.
- Student is acting withdrawn, volatile, tearful, etc.

- Student is acting out of character or differently than usual.
- Student is talking explicitly about hopelessness or suicide.
- Student has difficulty concentrating or difficulty carrying on normal conversation.
- Student has excessive dependence on others for company or support.
- Student reports feeling out of control of one's emotions, thoughts, or behaviors.

UND Cares about Your Success

Important information is available to you through Starfish, which is an online system used to help students be successful. When an instructor observes student behaviors or concerns that may impede academic success, the instructor may raise a flag that notifies the student of the concern and/or refer the student to their academic advisor or UND resource. Please pay attention to these emails and take the recommended actions. They are sent to help you be successful!

Starfish also allows you to (1) schedule appointments with various offices and individuals across campus, (2) request help on a variety of topics, and (3) search and locate information on offices and services at UND.

You can log into Starfish by clicking on Logins on the UND homepage and then selecting Starfish. A link to Starfish is also available in Blackboard once you have signed in.

Ensure Accessibility

To comply with the latest accessibility guidelines, documents posted online, including, but not limited to, Adobe PDF files, Microsoft Word documents, Microsoft PowerPoint presentations, and online flipbooks, must be screen-reader friendly. For directions on how to make your syllabus and other course materials accessible, visit the Creating Accessible Content webpage on the TTaDA site.