UNO INTRODUCTION TO INFORMATION SECURITY – CYBR 1100  
(Fulfills Information Security Credit in High School)

This UNO course has been approved by UNO faculty to be offered for dual credit, and this syllabus meets disciplinary outcomes as reflected in UNO’s master syllabus. Students must submit a dual credit application and meet all registration, academic, and other institutional requirements according to established deadlines in order to receive UNO course credit. Please visit dualenroll.unomaha.edu for additional information.

OMAHA NORTH HIGH MAGNET SCHOOL

Cyber Security
Course Syllabus

Instructor: Mr. Randall Henderson  
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Plan Periods: A3 and B4  
Office/Classroom Room 143  
Best times to contact: Via email or plan period/after-school

Course Description
This is a full year course that will focus on Information Security. We will also look at other topics in Computer Science such as Artificial Intelligence and Mobile Computing. While Information Security is the main topic, there may be some cross-discussion of multiple topics. This syllabus outlines the Information Security portion which will be offered for dual-enrolled credit with UNO.

This course emphasizes our current dependence on information technology and how its security in cyberspace (or lack thereof) is shaping the global landscape. Several historical and contemporary global events that have been influenced by the exploitation of information technology motivates topics on cyber crime, malware, intrusion detection, cryptography, among others, and how to secure one’s own data and computer system. Several aspects of this course are geared towards developing an understanding of the “cyberspace” as a new medium that breaks all geographical boundaries, while highlighting noticeable influences on it from social, political, economic and cultural factors of a geographical region.

Course Objective
Gain a thorough understanding of the foundational principles in the field of Information Assurance
How?
• Lectures, readings and self-study
  o Study of foundational/landmark papers and reports
• Case studies involving current topics and issues
• Guest lectures, educational videos and clips
• Class projects and reports
• Hands-on laboratory experience

Expected outcomes:
• Comprehensive overview of the subject area
  o What are the primary topics?
• What do we already know about them?
• Are we using what we already know?
• What are challenges?
• Past, Current and Future trends
  • A way to “think” about the concepts and materials

Topics in this course will include (but are not limited to):
  ➢ Introduction to the information Domain (ID)
    o Introduce the notion of “Threat” to an information system
  ➢ Explore technical and procedural approaches to mitigating the threat
  ➢ Give some consideration to the measurement of the success of the mitigation approaches.
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  ➢ Basic User, System, Internet & Network Security
  ➢ Malware
  ➢ Web Vulnerabilities
  ➢ Phone Phreaking
  ➢ Vulnerability Discovery
  ➢ Cyber Warfare
  ➢ Forensics
  ➢ Vulnerability Classifications
  ➢ Network Basics
  ➢ Steganography
  ➢ Cryptography

Expectations from Students:
• Students are expected to know how computers are organized, how they compute and how they communicate
• Be highly curious and have an uncommon passion for learning
• Eager to read and ability to synthesis an understanding of class topics from multiple sources
• Typical students in the class are seniors or graduate students

ETHICS
The study of information security creates the opportunity for students to develop an awareness of techniques, study approaches, experiment with very dangerous tools and malicious software. It should go without saying that you are expected to NOT do stupid and harmful things with this knowledge. However just to make certain that there is no confusion in your mind you will be expected to acknowledge a ETHICS STATEMENT on canvas to participate in this class and have access to STEAL (Security Technologies Education and Analysis Laboratories).
Ethics Sheet

I will make available an ethics sheet and usage policies that every student must complete and have their parents or guardian sign in agreement, due back by the end of week 3. Please note: If you and your parents do not agree with the policies, you will not be eligible to take this course.

Policy on Plagiarism

Any exam or assignment material submitted which looks identical in any fashion to another student’s work or external sources will be considered plagiarism. The grade of which will be adjusted to the minimum possible (Zero) for the assignment for all parties involved. Any further offenses will result in an “F” for the course, accompanied by any additional academic dishonesty actions taken by the student’s administrator. Note carefully Omaha North’s policy on academic honesty. You will have the opportunity to defend yourself if you are suspected of submitting plagiarized assignment. Cheating, fabrication and falsification, plagiarism or complicity in academic dishonesty will not be tolerated in this class. Copying text from public sources (websites, blogs, and books) or have someone else write for you will be considered plagiarism, if such sentences are not properly acknowledged or referenced. Make yourself familiar with writing techniques such that you can cite external sources without plagiarizing. Please see me if you have questions or need help.

Here are a few links to get you started:

Overview:
https://owl.english.purdue.edu/owl/resource/589/01/

Writing and Citing:
http://owl.english.purdue.edu/owl/resource/563/01/
https://owl.english.purdue.edu/owl/resource/619/01/


Instruction

Since this course will be dual-enrolled with UNO, you will have access to the UNO Canvas site. Lecture recordings will be made available by the UNO instructor and this is where you should start if you miss a class. We will discuss an array of topics in the course and attendance is vital to understanding this vast and interesting field.

Your grade will consist of your daily participation, several reflection papers and lab assignment and projects.

Resource Material

Textbook

Al Sweigart, Hacking Secret Ciphers with Python, Creative Commons, 2013.

Additional readings and supplemental materials will be provided in class and through Canvas

*Other reading materials:*

Blown to Bits: Your Live, Liberty, and Happiness after the Digital Explosion  
Hal Abelson, Ken Ledeen, Harry Lewis  
[http://www.bitsbook.com](http://www.bitsbook.com)


**UNO General Education Student Learning Outcomes (Global Diversity)**
This course also fulfills a UNO General Education requirement and is aligned with the following General Education Student Learning Outcomes (SLOs). After completing the course, successful students shall be able to do the following:

- recognize the cultural, historical, social, economic, and/or political circumstances that produce different social and cultural systems;
- demonstrate specific knowledge of the cultural, historical, social, economic, and/or political aspects of one or more countries or nations other than the United States;
- explain the interrelations among global economic, political, environmental and/or social systems; and
- explain ways in which identity is developed and how it is transmitted within and by members of the group or groups.

**Homework**

A word processor **must** be used for all written homework problems. Assignments submitted in any other form will not be graded. Proper spelling and grammar is also expected.

Assignments must be turned in on time. Accommodations can be made for extreme cases but you must discuss this with me BEFORE the due date.

**Discussions**

Every week, each student is expected contribute to a news discussion and exam questions discussion on Canvas by midnight on Mondays. These assignments will not apply in weeks of holidays or exams. Both these discussions will be graded.

**News Discussion**

Case studies based on current information security news and issues chosen by students will be discussed on Canvas.

**News Notes (Weekly)**

You are expected to submit a written paragraph summary, *in your own words*, of a current news article dealing with information security every Friday. A paragraph consists of more than two or
three sentences and you will be required to use proper grammar and spelling. There are many online sources for daily information security news such as: slashdot.org and www.securityfocus.com. These are only a couple of many possible sites and you should find others on your own by doing a search.

Your contribution to the news discussion must include these sections:

- **Headline:** The news article headline
- **Date:** The date the news article was published
- **Link:** The URL or reference to the source of the article.
- **Gist:** 2-3 sentences from the news article that highlights what the story is all about.
- **Relevance and Further Research:** Self-authored short and incisive 2-3 sentences that outline your opinions on the story or provides any additional information, definitions, explanations or references for other readers.

Additionally, you must include one question with answer that would make a good test question, based upon the previous class period's lecture or activity. **These daily assignments must be taken seriously.** You will be provided examples in class.

I will provide a sample news discussion article prior to the first discussion article.

**Exams**

There will be exams frequently throughout the course, including **two mid-term exams and a course final required by UNO.** All tests will be **closed** notes and **closed** books. Expect quizzes or a variety of unannounced writing activities throughout the course.

*A missed exam is automatically assigned a score of 0. You will be given 1 week to makeup exams. If you miss an exam you need to contact me as soon as possible. It is your responsibility to contact me to make arrangements to make up any work.*

**Course Project**

Students will complete a research-oriented project in the form of a 5-page paper (double spaced, 12 point Times New Roman font) with a 5 minute PowerPoint presentation.

**Research-oriented project:**

The objective of a research-oriented project is to study and digest advanced technical literature, and report on it in a form that is easy to understand for other students in the class. Extensiveness, comprehensibility and technical worthiness are major considerations. This is a list of suggested project topics. This is by no means an exhaustive list, and students are encouraged to pick a topic in which they are interested: Access Control; Multilevel Security; Digital Forensic; Biometrics; Network Attack and Defense; E-commerce security; Social Engineering; Phishing or Malware; Wireless Security; Secure Coding; Reverse Engineering; History of Information Security; Physical security; Privacy; Social Networks and security issues; Social, Political, Cultural and Economic influences on Cyber Attacks; Cyber warfare; Net neutrality; Law enforcement backdoors; Use of social media in protests; or any other topic in information security that you may want to pursue.

**Project Grading:**
Your overall semester project grade will be based on your proposal, final paper (5 pages) and your presentation. The final paper will summarize your findings. A high quality 5-minute presentation is required and will significantly bias the project grade.

Project Stages:

1. Proposal: You will communicate your interest in a topic for your project by preparing a 1-page proposal. More details will be posted on blackboard.
2. Presentation: You will prepare and deliver a 5-minute presentation. Expect to make a live presentation of your research project.
3. Research Paper: You will prepare a 5-page paper on your research topic.

OPS Secondary Grading Practices

All coursework and assessments are judged based on the level of student learning from “below basic” to “advanced.” This course will provide multiple opportunities to achieve at the “proficient” to “advanced” levels. Students are evaluated based on a proficiency scale or project rubric. Proficiency scales for this course are available upon request (teacher will identify location such as portal, teacher website, attached, etc.)

There are three types of coursework

- **Practice** – assignments are brief and done at the beginning of learning to gain initial content (e.g., student responses on white boards, a valid sampling of math problems, keyboarding exercises, and diagramming sentences, checking and recording resting heart rate). Practice assignments are not generally graded for accuracy (descriptive feedback will be provided in class) and are not a part of the grade. Teachers may keep track of practice work to check for completion and students could also track their practice work. Practice work is at the student’s instructional level and may only include Basic (2) level questions.

- **Formative (35% of the final grade)** – assessments/assignments occur during learning to inform and improve instruction. They are minor assignments (e.g., a three paragraph essay, written responses to guiding questions over an assigned reading, completion of a comparison contrast matrix). Formative assignments are graded for accuracy and descriptive feedback is provided. Formative work may be at the student’s instructional level or at the level of the content standard. Formative assessments/assignments will have all levels of learning – Basic (2), Proficient (3), and Advanced (4), which means that for every formative assessment/assignment, students will be able to earn an Advanced (4). Teachers will require students to redo work that is not of high quality to ensure rigor and high expectations. The students score on a formative assessment that was redone will be their final score.

- **Summative (65% of the final grade)** – assessments/assignments are major end of learning unit tests or projects used to determine mastery of content or skill (e.g., a research paper, an oral report with a power point, major unit test, and science fair project). Summative assignments are graded for accuracy. Summative assignments assess the student’s progress on grade level standards and may not be written at the student’s instructional level. Summative assessments/assignments will have all levels of learning – Basic (2), Proficient (3), and Advanced (4), which means that for every formative assessment/assignment students, will be able to earn an advanced (4).
To maintain alignment of coursework to content standards, which is a key best practice for standards-based grading, teachers will utilize a standardized naming convention for each of the standards within a course. The content standard will be marked on each assignment entered into Infinite Campus (District Grading Program) using all capital letters followed by a colon. After the colon will be the title of the coursework.

At the end of the grading period, scores are converted to a letter grade using this grading scale.

A = 3.26 – 4.00  
B = 2.51 – 3.25  
C = 1.76 – 2.50  
D = 1.01 – 1.75  
F = 0.00 – 1.00

Redoing/Revising Student Coursework
1. Students are responsible for completing all coursework and assessments as assigned.
2. Students will be allowed re-dos and revisions of coursework for full credit as long as they are turned in during that unit of study while a student still has an opportunity to benefit from the learning. When time permits, teachers should allow the redoing or revising of summative assessments.
3. Students are expected to complete assessments when given to the class, or if a student was justifiably absent, at a time designated by the teacher.
4. Redoing, retaking or revising will be done at teacher discretion in consultation with the student and parent(s). Teachers may schedule students before, during, or after school to address needed areas of improvement if not convenient during class. The time and location for redoing, retaking or revising will be done at the teacher’s discretion in consultation with the student and parent(s).
5. Scores for student work after retaking, revising or redoing will not be averaged with the first attempt at coursework but will replace the original score.

Academic Integrity: "The maintenance of academic honesty and integrity is a vital concern of the University community. Any student found responsible for violating the policy on Academic Integrity shall be subject to both academic and disciplinary sanctions." Via studentlife.unomaha.edu/integrity